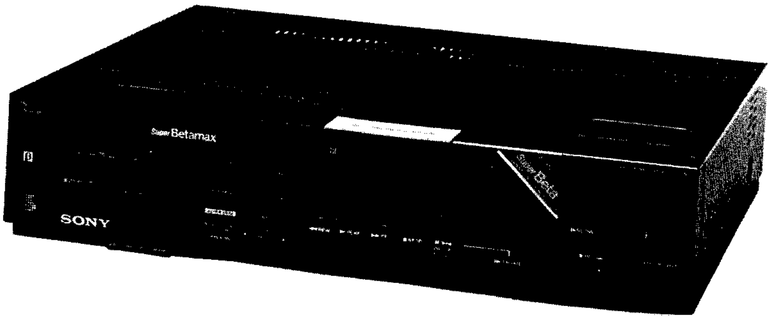
SL-F90
RMT-146/228

SERVICE MANUAL

E Model
Spanish Model
EC Model
ME Model



September, 1986

Super Betamax

SPECIFICATIONS

This manual contains the SUPPLEMENT-1.

SYSTEM

Video recording system	Rotary two-head helical scanning
Video signal	CCIR standards, and PAL color
Channel coverage	VHF: Western European channels E2-E12 UHF: Western European channels E21-E68 (Up to 30 programs can be preset)
Aerial input	75 ohms, asymmetrical aerial socket
RF output signal	UHF channels E30 to E39 (variable) 75 ohm, unbalanced

VIDEO

Input: VIDEO IN	Phono jack: $1.0\ \mathrm{V}\,^{+1.0}_{-0.5}\ \mathrm{V}$ (p-p) 75 ohm, unbalanced, sync negative
Output: VIDEO OUT	Phono jack: 1.0 ±0.1 V (p-p) 75 ohm, unbalanced, sync negative

AUDIO

Input: AUDIO IN	Phono jack: 47 kohms, −10 dBs (0 dBs = 0.775 Vrms)
Output: AUDIO OUT	Phono jack: Load impedance less than 10 kohms, −10 dBs with 47 kohms load, unbalanced

TAPE TRANSPORT

Tape speed	18.73 mm/sec.
Maximum recording time	2 hours 10 min. (with Sony L-500 cassette) 3 hours 15 min. (with L-750)
Fast forward/rewind time	Within 5 min. (with L-500)

TIMER

Clock	Crystal lock
Time indication	24-hour cycle
Timer setting (Only for recording)	6 events/week, adjustable for any day or for all 7 days of the week

GENERAL

Power requirements	Spanish Model : 220V AC Indonesia Model: 110, 127, 220 or 240V AC adjustable 50/60Hz
Power consumption	39 W
Storage temperature	−20°C to +60°C
Operating temperature	5°C to 40°C
Dimensions	430 × 95 × 367 mm (W/H/D) including projecting parts and controls
Weight	8.0 kg

SUPPLIED ACCESSORIES

75 ohm coaxial cable for recorder to TV connection	1
Screwdriver for RF channel adjustment	1
Remote Commander RMT-146 with two IEC designation R6 batteries (size AA)	1

Design and specifications are subject to change without notice.

MICROFILM

Beta

VIDEO CASSETTE RECORDER

SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

TABLE OF CONTENS

Section *Title* *Page*

1. GENERAL

1-1. Precautions 4
1-2. Note on Operating Voltage 4
1-3. Location and Function of Controls 5
1-4. Connections 8
1-5. Adjusting the TV 9
1-6. Setting the Clock 10
1-7. Programing TV stations 11
1-8. Recording TV Programs 12
1-9. Playback 14
1-10. Various Playback Modes 15
1-11. Use of the Tape Counter 16
1-12. Timer-Activated Recording 17
1-13. Quick Timer Recording 19
1-14. Camera Recording 20
1-15. Editing a Tape 20

2. DISASSEMBLY

2-1. Disassembly of Cabinet 23
2-2. Removal of the ST-12 Board 23
2-3. Removal of the AU-26 Board and the VI-23 Board 24
2-4. Removal of the Reel Block Assembly 24
2-5. Removal of the MF-17 Board and the MF-16 Board 25
2-6. Removal of the RP-41 Board 26
2-7. Removal of the PS-115 Board 27
2-8. Removal of the FL Cassette Compartment Assembly 27
2-9. Removal of the MD Block Assembly 28
2-10. Internal Views 29

3. DIAGRAMS

3-1. Circuit Boards Location 30
3-2. Overall Block Diagram 31
3-3. Video Block Diagram 34
3-4. System Control Block Diagram 37
3-5. System Control-Video Block Interface 40
3-6. System Control-Mechanism Block Interface 40
3-7. System Control-Reel Block Interface 41
3-8. System Control-System Control Peripheral Circuit Interface 41

Section *Title* *Page*

3-9. System Control-Servo Block Interface 43
3-10. System Control-Audio Circuit Interface 44
3-11. System Control-Timer Block Interface 44
3-12. Servo Block Diagram 46
3-13. Tuner Block Diagram 49
3-14. Audio Block Diagram 52
3-15. Audio Level Diagram 53
3-16. Timer Block Diagram 54
3-17. Power Block Diagram 56

4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. Frame Schematic Diagram 57
4-2. Printed Wiring Boards and Schematic Diagram 60
- ●RP-41 Board 61
- ●VI-23 Board 66
- ●ST-12, MI-5, MI-6, DR-38, LM-16 and R STATOR Boards 74
- ●AU-26, MF-15, MF-16 and MF-17 Boards 84
- ●PS-115 and VS-11 Boards 93

4-3. Semiconductors 98

5. EXPLODED VIEWS

5-1. Front Panel and Cabinet Assembly 101
5-2. Tuner, Timer and Power Assembly 102
5-3. Front Loading Assembly 103
5-4. Chassis Assembly (1) 104
5-5. Chassis Assembly (2) 105
5-6. Drum Assembly 106
5-7. Reel Block Assembly 107
5-8. Hardware List 108

6. ELECTRICAL PARTS LIST 109

7. ADJUSTMENTS 127

REMOTE COMMANDER (RMT-146) 181

SUPPLEMENT-1

Remote Commander (RMT-228) 5

SL-F90 (ME Model)

SECTION 1
GENERAL

1-1. PRECAUTIONS

On safety

- Before operating, check that the operating power voltage and frequency of the unit are identical with those of your local power supply.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by the plug. Never pull the cord itself.
- The unit is not disconnected from the mains (ac power source) as long as it is connected to the mains outlet, even if the unit itself has been turned off.

On installation

- Allow adequate air circulation to prevent internal heat build-up.
- Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Do not install the unit near heat sources such as radiators or air ducts or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- The unit is designed for operation in a horizontal position. Do not install it in an inclined position.
- Keep the unit and cassette tapes away from equipment with strong magnets, as for example a microwave oven or a large loudspeaker.
- Do not place any heavy object on the unit.

On operation

- When the unit is not in use, turn off the power to conserve energy and to extend its useful life.
- Remove and store video cassettes after recording or playback.
- Store the cassettes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.

On cleaning

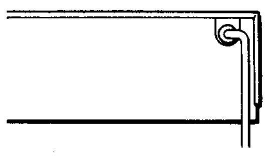
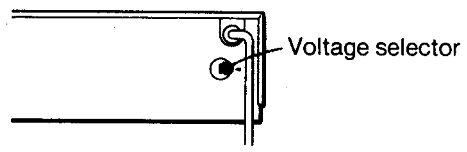
Clean the cabinet, panel and controls with a soft dry cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine which might damage the finish.

On repacking

Do not throw away the carton and packing materials. They make an ideal container in which to transport the unit. When shipping the unit to another location, repack it as illustrated on the carton.

1-2. NOTE ON OPERATING VOLTAGE

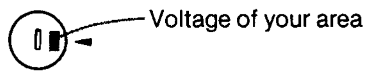
Depending on the area to be used, the SL-F90 comes in two models to suit the local operating power voltage.
Check which type your model is and be sure to follow Caution below before plugging the unit to the wall outlet.

	Voltage
Type 1 (Spanish Model) Rear panel 	220 V
Type 2 (Indonesia Model) Rear panel 	110/127/ 220/240 V

Caution

- **For the Spanish Model**
  Operate the unit only on 220 V AC.

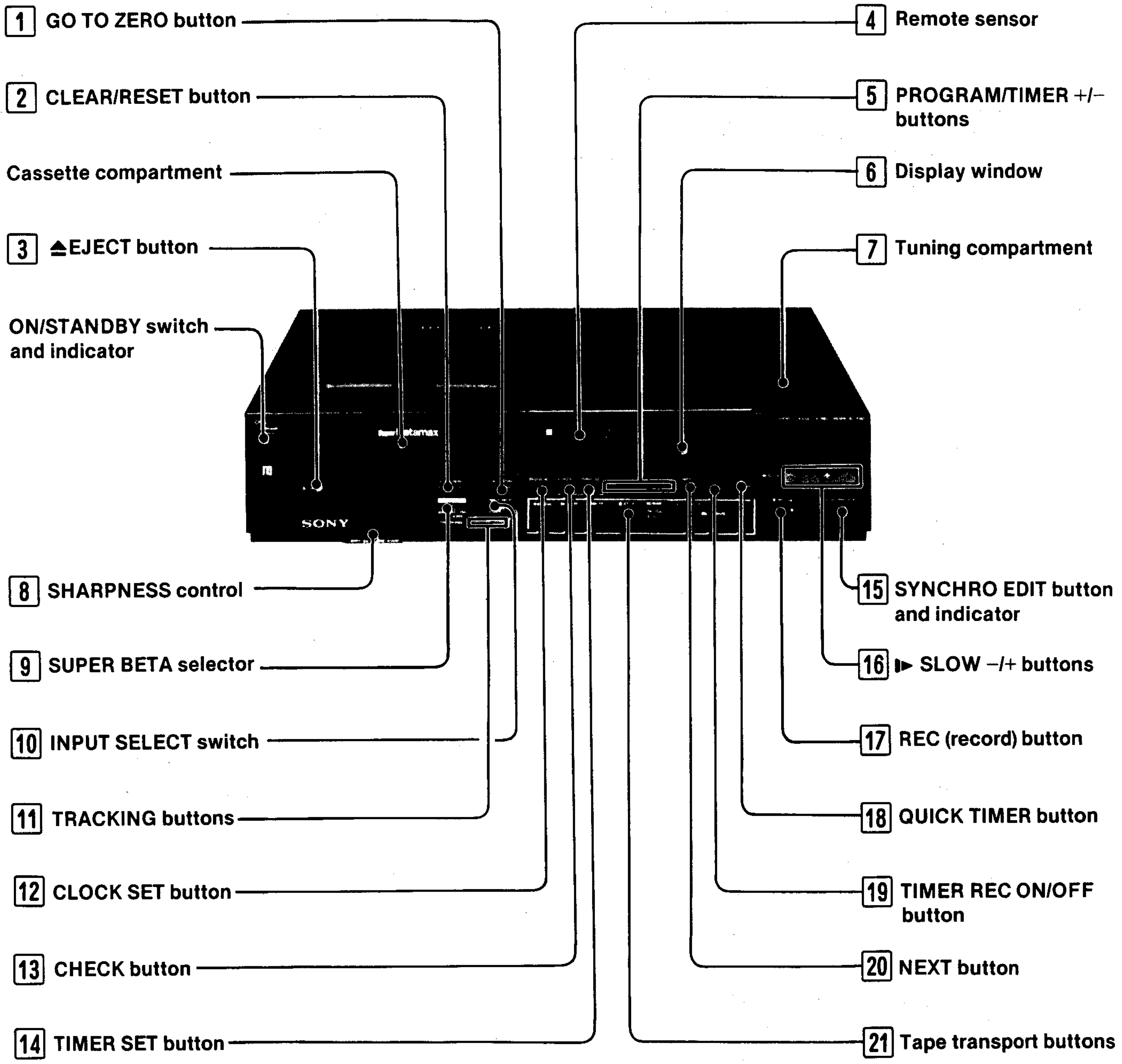
- **For the Indonesia Model**
  Make sure to set the voltage selector in accordance to the power voltage of your area. The unit may suffer **serious damage** if the voltage selector is not set correctly.



1-3. LOCATION AND FUNCTION OF CONTROLS

For details on the use of each control, refer to the pages indicated in the black circles ●

Front



1 GO TO ZERO button
2 CLEAR/RESET button
Cassette compartment
3 ⏏EJECT button
ON/STANDBY switch and indicator
8 SHARPNESS control
9 SUPER BETA selector
10 INPUT SELECT switch
11 TRACKING buttons
12 CLOCK SET button
13 CHECK button
14 TIMER SET button
4 Remote sensor
5 PROGRAM/TIMER +/– buttons
6 Display window
7 Tuning compartment
15 SYNCHRO EDIT button and indicator
16 ▮▶ SLOW –/+ buttons
17 REC (record) button
18 QUICK TIMER button
19 TIMER REC ON/OFF button
20 NEXT button
21 Tape transport buttons
SONY

1 GO TO ZERO button
In stop mode, press to advance or rewind the tape approximately to the counter "0H00M00S" point.

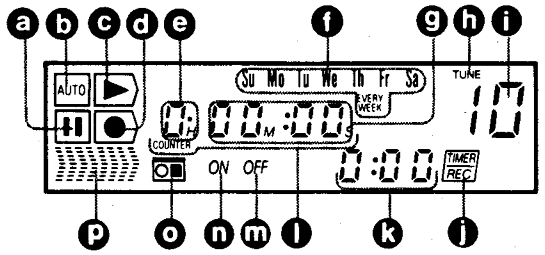
2 CLEAR/RESET button
Press to reset the tape counter to "0H00M00S" and also to clear the timer setting.

3 ⏏ EJECT button
Press to eject the cassette.

4 Remote sensor
Detects the signals transmitted from the Remote Commander.

5 PROGRAM/TIMER +/– buttons
Press to select the programs and to set the clock or timer program.

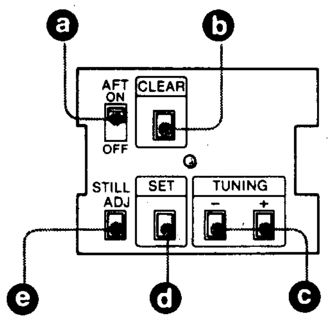
6 Display window



ⓐ
ⓑ
ⓒ
ⓓ
ⓔ
ⓕ
ⓖ
ⓗ
ⓘ
AUTO
Su Mo Tu We Th Fr Sa
EVERY WEEK
TUNE
COUNTER
ON OFF
TIMER REC
ⓟ
ⓞ
ⓝ
ⓜ
ⓛ
ⓚ
ⓙ

ⓐ Lights during pause
ⓑ Lights during auto play, tape return play or automatic cassette eject
ⓒ Lights during playback
ⓓ Lights during recording
ⓔ Timer program position during timer setting
ⓕ Day indicator
ⓖ Turn-on time of the timer during timer setting
ⓗ Lights during TV channel presetting
ⓘ Program number
ⓙ Lights when TIMER REC ON/OFF or QUICK TIMER is pressed.
ⓚ Clock display
During timer setting, the turn-off time is displayed.
ⓛ Tape counter
ⓜ Turn-off indicator
ⓝ Turn-on indicator
ⓞ Lights when a cassette is inside
ⓟ Speed and direction indicator of the tape movement

7 Tuning compartment ⓫



ⓐ
ⓑ
AFT ON
OFF
CLEAR
STILL ADJ
SET
TUNING
– +
ⓔ
ⓓ
ⓒ

ⓐ AFT switch
ⓑ CLEAR button
ⓒ TUNING button
ⓓ SET button
ⓔ STILL ADJ (adjust) button

8 SHARPNESS control
Adjusts the sharpness of the picture if necessary. Normally set the control at the center detent position.

9 SUPER BETA selector ⓭
Normally keep this selector at NORMAL. To record or play back in Super Beta, set to STD or PRO.

10 INPUT SELECT switch
Select the program to be recorded.
TUNER: For recording TV programs
LINE: For recording signals from the VIDEO IN and AUDIO IN

11 TRACKING buttons ⓯
Press if streaks, snow or noise band appear during normal or slow motion playback.

12 CLOCK SET button
Press to start the setting of the current time.

13 CHECK button
Press to check the contents of the timer presettings.

14 TIMER SET button
Press to start the setting or resetting of the timer recording.

15 SYNCHRO EDIT button and indicator ㉑ ㉒
Press to start and stop playback on the SL-F90 and recording on another VCR simultaneously, when editing a tape.

16 ▮▶ SLOW +/– buttons
Press to obtain a slow motion picture during playback or pause of playback.

17 REC button
Slide to the right to start the recording.

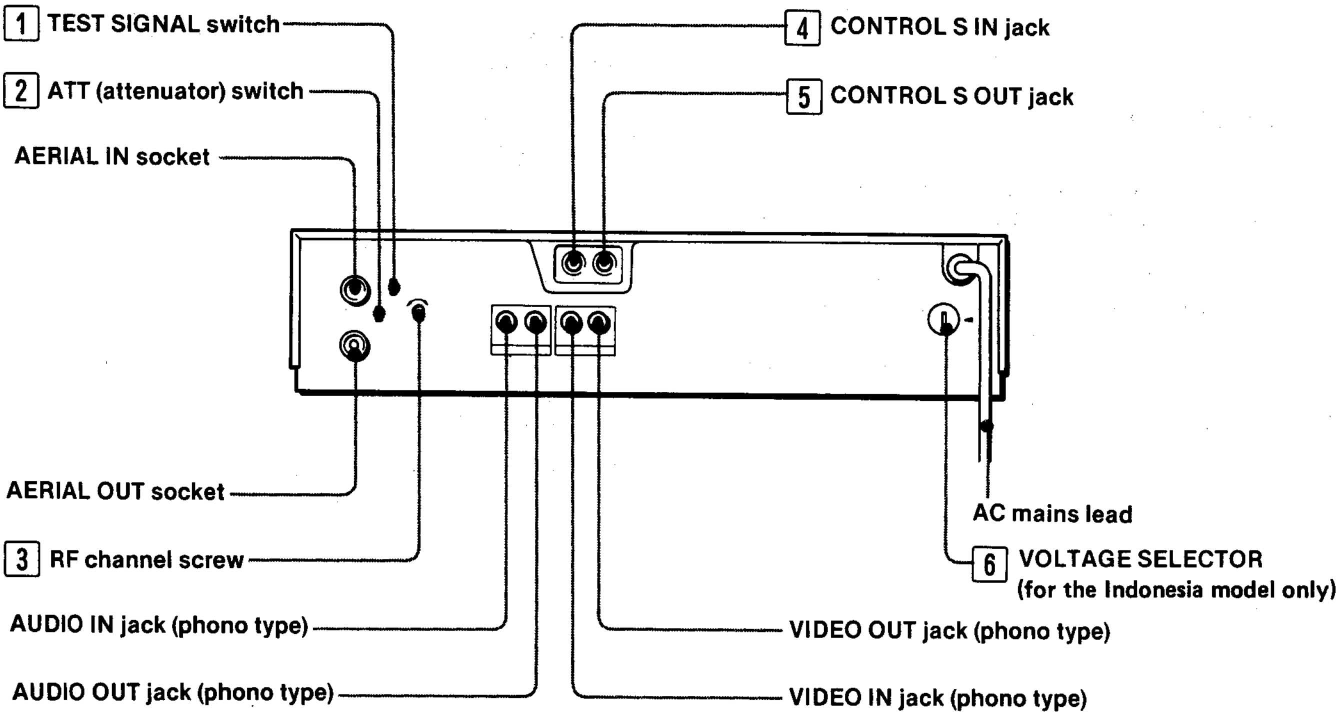
18 QUICK TIMER button ⓳
Press to start the timer recording quickly. The recording time is selected in 30 minute intervals, from 0:30 to 4:00. Press this button as many times as required until the desired recording time is displayed.

19 TIMER REC ON/OFF button
Press to activate the timer recording.

20 NEXT button
Press to advance to the next item to be set during clock or timer setting.

21 Tape transport buttons
◀◀ REW (rewind), ▶ PLAY, ▶▶ FF (fast forward), ■ STOP, ▮▮/▶◀ PAUSE/STILL, ▮▮▶ FRAME

REAR


1 TEST SIGNAL switch
2 ATT (attenuator) switch
AERIAL IN socket
4 CONTROL S IN jack
5 CONTROL S OUT jack
AERIAL OUT socket
3 RF channel screw
AUDIO IN jack (phono type)
AUDIO OUT jack (phono type)
AC mains lead
6 VOLTAGE SELECTOR (for the Indonesia model only)
VIDEO OUT jack (phono type)
VIDEO IN jack (phono type)

1 TEST SIGNAL switch
Set to ON to obtain the test pattern for adjusting the TV so that it can receive the signal from the recorder.

2 ATT switch
Normally set this switch to DX. If the TV signal is very strong, set the switch to LOCAL.

3 RF CHANNEL screw
If there is interference on the factory-preset channel for RF output and the signal of this recorder cannot be displayed clearly on the TV screen, adjust this screw with the supplied screwdriver.

4 CONTROL S IN jack (mini type)
Connect to the CONTROL S output jack of other Sony products for various systematic operations.

5 CONTROL S OUT jack (mini type)
Connect to the CONTROL S input jack of another Sony VCR for syncro editing operation.

6 VOLTAGE SELECTOR (for the Indonesia model only)
Set to 110, 127, 220, or 240 V according to your local power line voltage.

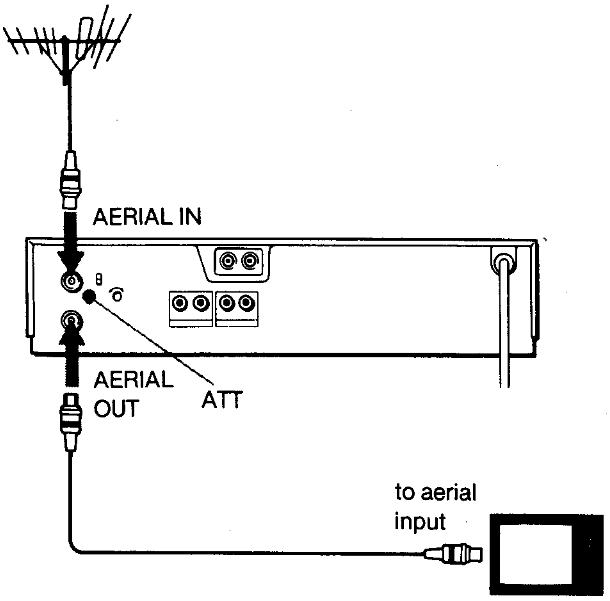
1-4. CONNECTIONS

Notes

- Unplug each unit from the mains outlet before making the following connections.
- Make sure the connections are secure. A loose connection may cause a noisy picture.

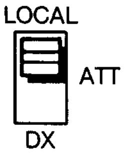
CONNECTING A TV

1 Remove the aerial cable from its socket in the back of the TV. Then connect the aerial cable to the AERIAL IN socket at the rear of the recorder.
2 Connect the aerial input of the TV to the AERIAL OUT socket of the recorder, using the supplied cable. Each socket accepts only one particular end of the cable.
3 Connect the recorder and the TV to the mains supply with their own mains leads.
4 Turn on the power of each unit.



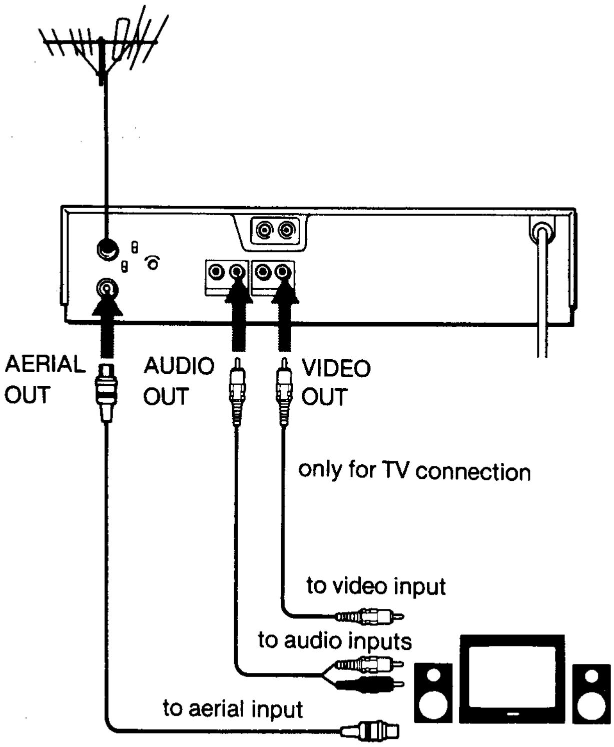
Now the recorder is set up to intercept all signals from the aerial on their way to the TV. The recorder then passes on the signals to the TV. This is why you can record a program while it is being shown on the TV, or while the TV is showing another program, or even when the TV is turned off.

Notice for customers in a strong signal area
The recorder has a booster to assure stable TV reception. However, in areas near TV stations, where the TV signal is very strong, the picture may be affected by the booster. If this happens, set the ATT switch on the rear panel to LOCAL.



CONNECTION FOR BETTER PLAYBACK PICTURE AND SOUND

If your TV receiver/color monitor is equipped with video/audio inputs



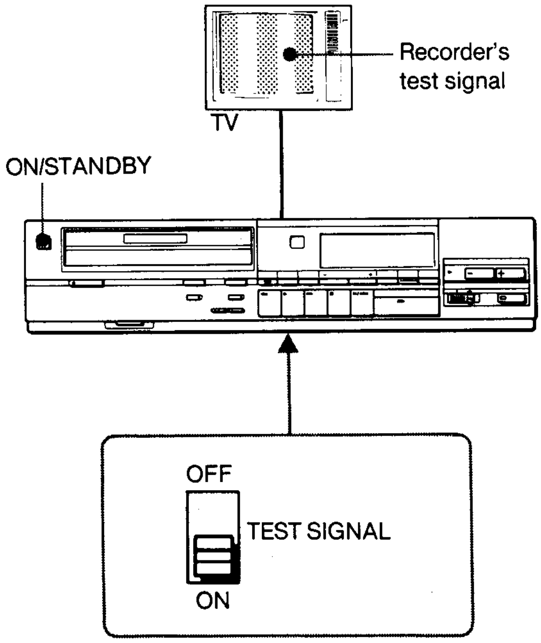
Connection with a color monitor
Connection between the recorder AERIAL OUT socket and the color monitor is not possible since the monitor is not equipped with a tuner. For this reason, you cannot watch a TV program while recording another program on the recorder.

1-5. ADJUSTING THE TV

One of the television program positions must be adjusted to receive the signal from the recorder.
Note that the adjustment is not necessary, however, when the recorder is connected to the video/audio inputs on the TV receiver/monitor.

1 After making the connections, press the ON/STANDBY button.
2 Make sure that the recorder is in the stop mode.
3 Set the TEST SIGNAL switch located at the rear of the recorder to ON. The test signal is transmitted on a channel between UHF channels E30 and E39.
4 Turn on the TV and select a program position which is not being used to receive a TV station. Tune the channel until you see a clear black and white pattern on the TV screen and you hear a continuous tone. This is the recorder's test signal.

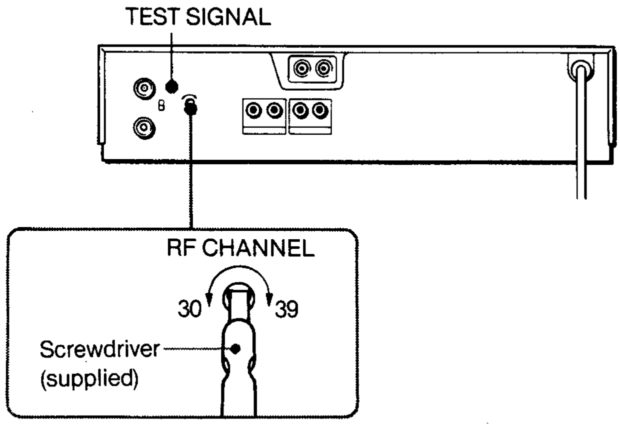
— If you are not sure how to adjust your TV, please refer to the TV's instruction manual or consult your dealer.



Whenever you use the video recorder, you should set the TV to the program position selected in this adjustment.

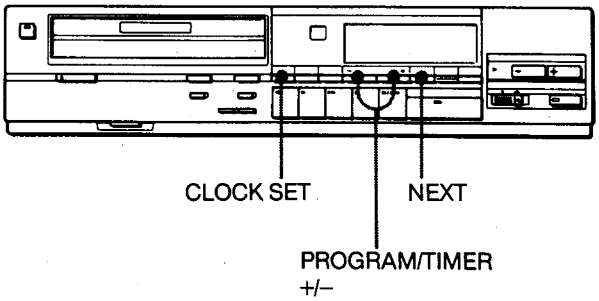
If the test picture is free of disturbance, the TV adjustment is complete. Set the TEST SIGNAL switch to OFF.

If the test picture is not free of disturbance
1 Reset the TEST SIGNAL switch to OFF.
2 Adjust the channel of the TV to a channel between UHF channels E30 and E39 with the tuning control or the fine tuning control on the TV, so that the TV screen shows no picture and so that a steady rustling sound or no sound is heard.
3 Set the TEST SIGNAL switch to ON again.
4 Slowly turn the RF CHANNEL screw on the back of the recorder with the supplied screwdriver, until you see an undistorted test pattern on the TV screen.
5 Now the TV adjustment is complete. Reset the TEST SIGNAL switch to OFF.



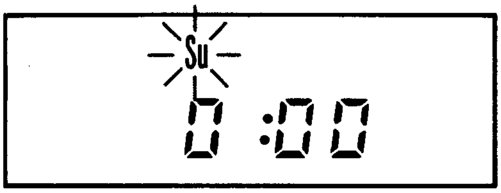
1-6. SETTING THE CLOCK

When you connect the AC power cord to a wall outlet, the clock indicates "0:00" and it will blink to show that the clock is ready to be set.



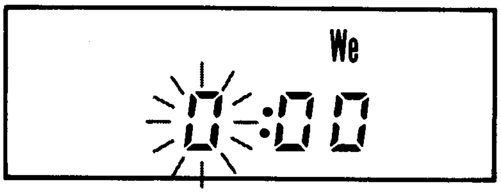
Example: to set for Wednesday afternoon at 3:56

1 Press CLOCK SET.



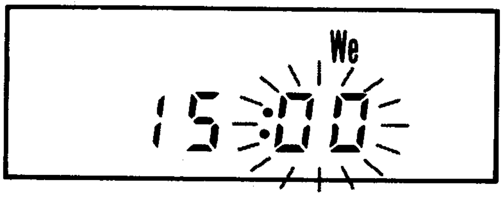
Set the day with the + or – button until "We" appears.

2 Press NEXT.



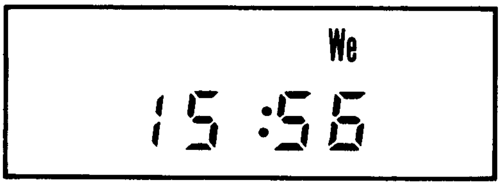
Set the hour with the + or – button until "15:00" appears.

3 Press NEXT.



Set the minute with the + or – button until "15:56" appears.

4 Press NEXT.
(For accurate setting, press NEXT at the same time with an announced time signal.)
The clock will now show the current time.



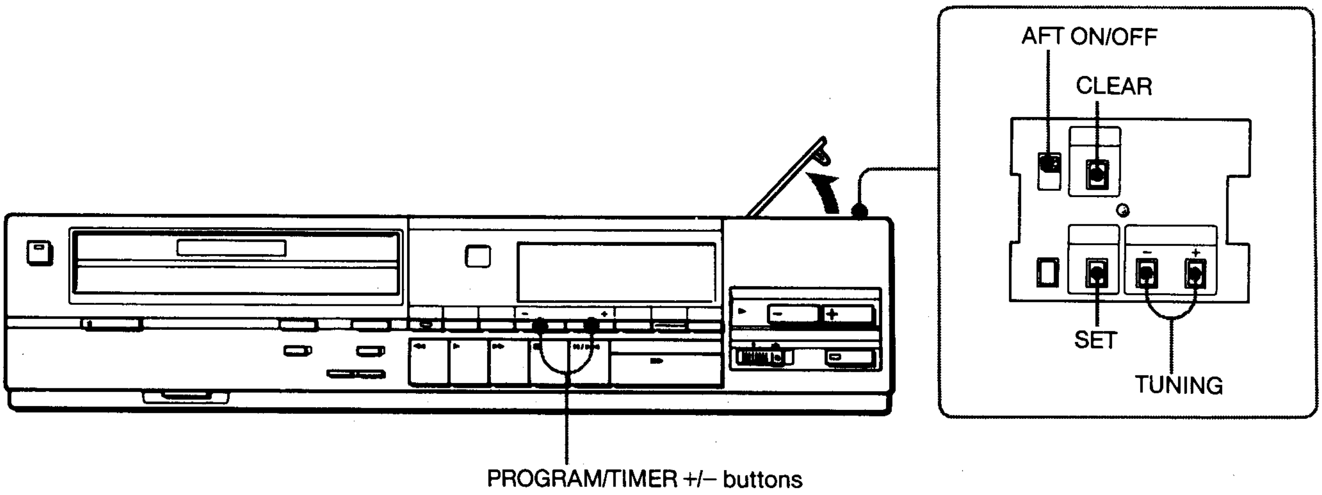
The dots of the colon (:) alternately blink every 30 seconds.

PROGRAM/TIMER +/– buttons
The + and – buttons can be used in two ways:

When you keep a button pressed, the digits will advance continuously until the button is released.

When you press and immediately release a button, the digits will advance by one.

1-7. PROGRAMING TV STATIONS



This recorder has 30 program positions. Once you preset the programs broadcast in your area, program selection is simply made by pressing the + or – button on the recorder or the hand-held Remote Commander.
To start programing, turn on the SL-F90 by pressing ON/STANDBY switch and set the INPUT SELECT switch to TUNER.

1 Press the SET button.
2 Press the + or – PROGRAM/TIMER button to select the program position.
    + for a higher-numbered program position
    – for a lower-numbered program position
3 Press the + TUNING button to locate a station with higher frequency and the – TUNING button to locate a station with lower frequency. The tuning indicator in the display window shows the approximate location of the current channel. When a station has been received, the search will stop. Press the + or – TUNING button again, until the desired station is received.

Repeat steps 2 and 3 for all the desired stations.

4 Press the SET button again so that the tuning indicator disappears.

To cancel an unused program

1 Select the program to be cancelled with the + or – PROGRAM/TIMER button.
2 Press the SET button.
3 Press the CLEAR button.
4 Press the SET button again.

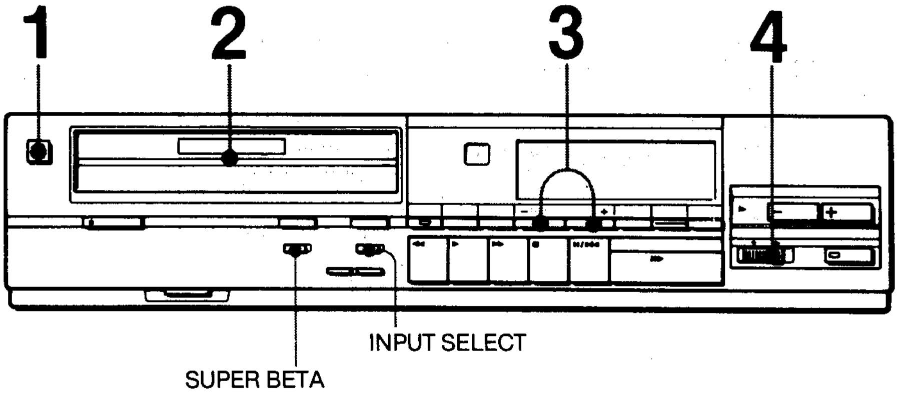
Then the cancelled program will be skipped when the + or – PROGRAM/TIMER button, or the + or – side of the PROGRAM button on the Remote Commander is pressed. When the corresponding program number button on the Commander is pressed, the sound of the cancelled program will be cut out.

To fine tune a station

If the picture of a particular station is not acceptable, check that the SET button is set to OFF, set the AFT switch to OFF and keep the + or – TUNING button pressed until the picture becomes clear. To view this particular station, set the AFT switch to OFF.

1-8. RECORDING TV PROGRAMS

OPERATION **Numbers in the illustration show the sequence of operation.**

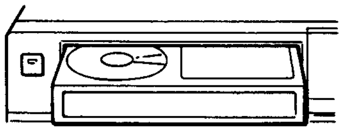


Preparation

- Check the positions of the selectors.
  SUPER BETA → Normally NORMAL
  INPUT SELECT → TUNER
- Turn on the TV and select the program for the recorder.

1 Turn on the power.

2 Insert a cassette.
Insert the cassette with the side that has the window up (you can see the tape through the window).



3 Select the program to be recorded with the + or – button.

4 Slide REC to the right. The recording will begin.

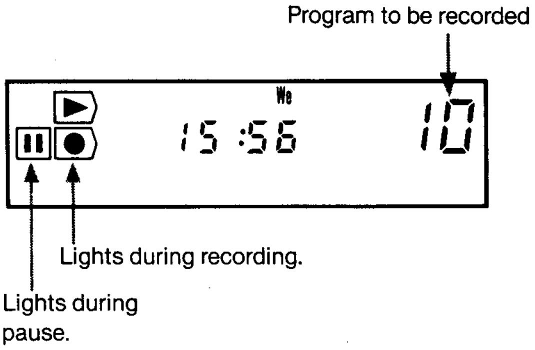
To stop recording, press ■.
When the tape reaches its end, it will be rewound to the beginning.

To eject the cassette, press ⏏ EJECT.

To turn off the power, press ON/STANDBY.

To stop the tape momentarily
Press ❚❚/▶◀. The TV program can still be seen on the TV, but the picture will not be recorded.
To resume recording, press ❚❚/▶◀ again.
To protect the video heads and the tape, the pause mode will be automatically released after about 8 minutes and **recording will stop.**

Check in the window



CAUTION
Television programs, films, video tapes and other materials may be copyrighted.
Unauthorized recording of such material may be contrary to the provision of the copyright laws.

Note
The power can be automatically turned on by inserting a cassette without pressing ON/STANDBY.

In case you want to record a tape which is to be played back on another recorder from the very beginning of the tape, run the tape for about 15 seconds before starting recording. Otherwise you may miss the starting point during playback on the other machine.

SUPER BETA selector

NORMAL position: Normally keep the selector in this position. When playing back tapes recorded on other non-Super Beta recorders or tapes recorded on this recorder by setting this selector to the NORMAL position, set the selector in this position.

SUPER BETA STD (standard) position: In this position, high quality recording and playback picture are obtained.

SUPER BETA PRO position: If you use the highest-grade tape such as Sony PRO-X or equivalent tapes from other tape manufactures, further enhanced picture quality is attained. With lower-grade tapes, however, the picture quality will suffer somewhat.

Note
The picture quality will suffer somewhat, if a tape recorded in the SUPER BETA PRO or STD position is played back on other non-Super Beta recorders, or on this recorder with this selector set to NORMAL.

TO START RECORDING FROM A PARTICULAR POINT

You can decide the starting point for recording while watching the playback picture or by searching for the point using the Picture Search and Skip Scan (on page 15) functions.

1. Search for the point where you wish to start recording on the tape by playing back the tape or using the Picture Search or the Skip Scan function.
2. Press ❚❚▶◀ to stop the tape where you wish to start recording.
3. Slide REC to the right. The recorder will enter the recording pause mode and the picture selected by INPUT SELECT will appear on the monitor screen.
4. Press ❚❚▶◀ to release the pause mode.
   Recording starts.

TO VIEW ONE TV PROGRAM WHILE RECORDING ANOTHER

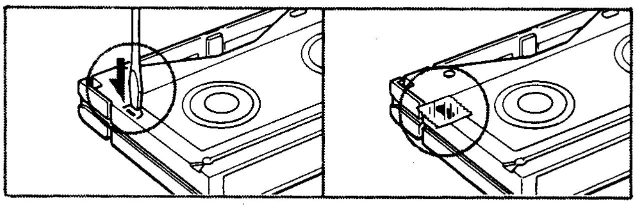
Select the channel you want to view on the TV.

TO KEEP A RECORDED PROGRAM FROM BEING ACCIDENTALLY ERASED

When a new recording is made on a previously recorded cassette, the previous recording will be automatically erased.

To avoid erasing a recording
Break off the safety tab using a screwdriver or similar object.

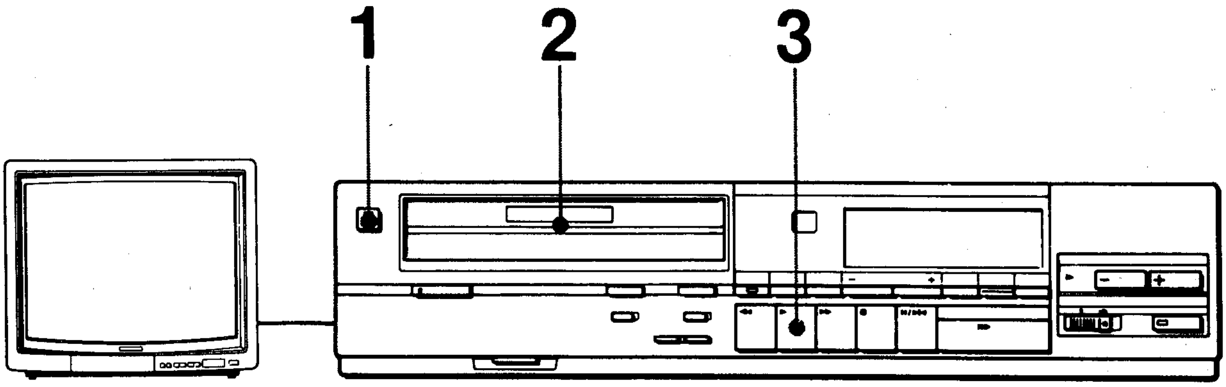
To re-record on a cassette which has had the safety tab removed
Cover the slot with a piece of plastic tape.



If you activate the ● RECORD, TIMER REC ON/OFF, VIDEO INSERT or AUDIO INSERT button with a cassette with its safety tab removed inserted, the cassette will be automatically ejected.

1-9. PLAYBACK

OPERATION **Numbers in the illustration show the sequence of operation.**



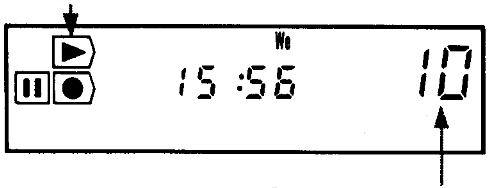
1 Turn on the power.

2 Insert a cassette.

3 Press ▶ PLAY.

Check in the window

Lights during playback.

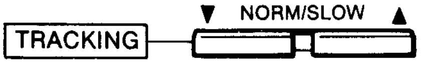


Channel previously viewed.

AUTO PLAY
— To play back a tape from the beginning of the tape after rewinding
Press ▶ PLAY while holding ◀◀ REW depressed.
After the tape is completely rewound, it will be automatically played back.

WHEN YOU PLAY BACK A TAPE RECORDED ON ANOTHER VCR

- If streaks or snow appear, press TRACKING ▲ or ▼ until the best possible picture is obtained. After viewing that particular tape, press TRACKING ▲ and ▼ simultaneously to reset the tracking to the standard position.



- To get a sharp picture, turn SHARPNESS towards the right.

SOFT — SHARPNESS — SHARP

1-10. VARIOUS PLAYBACK MODES

PICTURE SEARCH

— Viewing the picture at a fast speed to find a particular scene

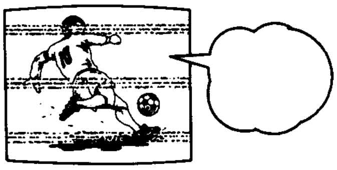
Keep pressing ▶▶ FF or ◀◀ REW during playback.
When you release the button, normal playback will be resumed.

SKIP SCAN

— Viewing the picture momentarily during fast-forward or rewind

Keep pressing ▶▶ FF or ◀◀ REW during fast-forward or rewind mode.
When you release the button, the fast-forward or rewind mode will be resumed.

Streaks will appear and sound will be muted in the Picture Search and Skip Scan pictures.



STILL PICTURE

Press ❚❚/▶◀ during playback (in normal or slow mode). The sound is muted.
Press ❚❚/▶◀ again or press ▶ PLAY to resume normal playback.
To protect the video heads and the tape, the pause mode will be automatically released after about 8 minutes and playback will be resumed.

FRAME-BY-FRAME PICTURE

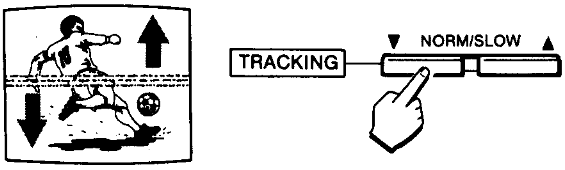
Press ❚❚▶ FRAME in still picture mode.
Press ❚❚/▶◀ again or press ▶ PLAY to resume normal playback.

SLOW MOTION PICTURE

Press ❚▶ SLOW during normal playback or in still picture mode. Press – for lower speed, and + for higher speed. The playback speed will change from normal to 1/5, 1/7, 1/10, 1/15, 1/20, and 1/30, of the normal speed successively, by pressing –. The sound is muted. Press ▶ PLAY to resume normal playback.

TO OBTAIN BETTER PLAYBACK PICTURE
— in still, frame-by-frame or slow motion picture mode

- **If the picture seems to shake...**
  Set the VCR to the still **picture mode,** and then press STILL ADJ in the tuning compartment until the picture stabilizes.
- **If a noise band appears on the screen...**
  Set the VCR to the slow motion picture mode, and then move the noise band by pressing TRACKING ▲ or ▼. Readjustment may be necessary for the tapes recorded on other VCRs.



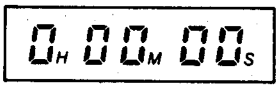
1-11. USE OF THE TAPE COUNTER

The tape counter indicates the approximate running time of the tape and the relative position of programs on the tape.

TO INDEX THE TAPE CONTENTS

Before starting recording or playback, press CLEAR/RESET to set the counter to “0H00M00S”. By noting the counter reading at the desired point, you can easily find that point later by referring to the counter. Use the label on the cassette to list the programs and their counter readings.

CLEAR/RESET



Notes
- The counter reading is automatically reset to zero when a cassette is newly inserted.
- The counter reading will be retained in the memory even after the power is turned off, as long as the cassette is in the cassette compartment.
- The counter will not advance during any portion of a tape that is blank or unrecorded. So the counter can be used to find unrecorded sections on a tape.

GO TO ZERO/GO TO ZERO PLAY

— To stop the tape at a particular point or play back from a particular point

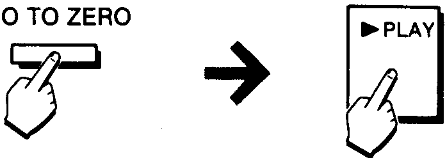
1 During recording or playback, press CLEAR/RESET at the point you want to locate later.

2 When recording or playback is finished, stop the tape and press GO TO ZERO.
The tape will be rewound or advanced close to the point where the counter reads “0H00M00S”.

GO TO ZERO

To start playback automatically from the “0H00M00S” point
Press ▶ after pressing GO TO ZERO.

GO TO ZERO



Note
The “go to zero” and “go to zero play” functions cannot be activated when the counter reading is within ± 0H00M29S.

1-12. TIMER-ACTIVATED RECORDING

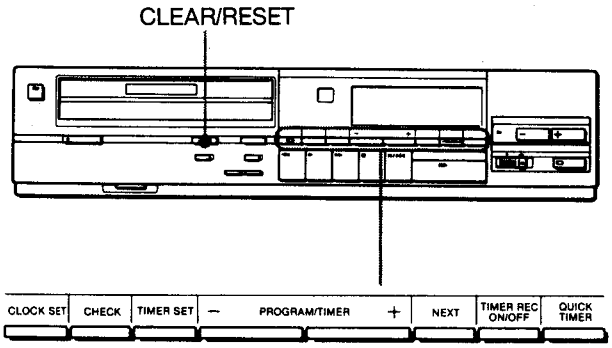
Up to six events can be set to be recorded on a certain day or everyday within seven days, or on the same day every week.

BEFORE SETTING THE TIMER

- Make sure that the clock (day and time) is set correctly.
- Be sure a cassette with a safety tab is inserted in the compartment.
  Check with the ▣ indicator in the window.

SETTING THE TIMER

Suppose you want to make a recording of channel 6 from 7:10 to 11:15 on Friday.


CLEAR/RESET
CLOCK SET
CHECK
TIMER SET
–
PROGRAM/TIMER
+
NEXT
TIMER REC ON/OFF
QUICK TIMER

NEXT button
Every time you press the NEXT button, the item to be preset next will blink.

+/– buttons
To set the day of the week, the time and the channel, press the + button to advance, and the – button to go back.

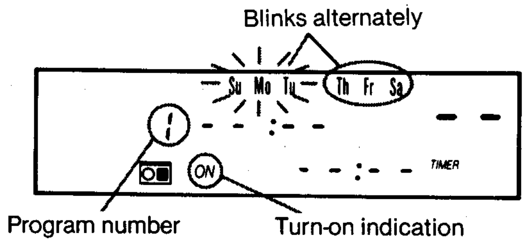
Day indication
By pressing the + button, the day indication changes as follows:
Ex. Today is Friday.

Su Mo Tu We Th Fr Sa → Fr → Sa → ... → Th
(everyday) (today) (tomorrow)
Th ← .... ← Sa ← Fr ←
EVERY WEEK EVERY WEEK EVERY WEEK

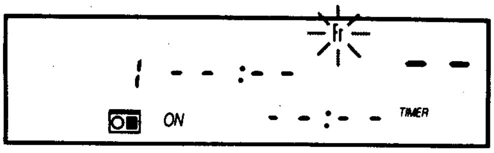
To record at the same time every day, select "Su Mo Tu We Tu We Th Fr Sa".
To record at the same time and day every week, select the desired day indication with "EVERY WEEK".

1 Set the positions of the selectors correctly as on page 9.

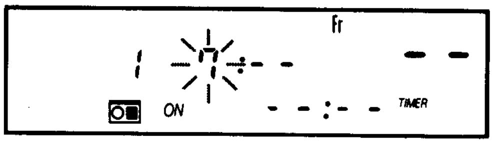
2 Press TIMER SET.
The program number (up to 6) appears. "1" indicates that you are making the first timer setting.


Blinks alternately
Su Mo Tu Th Fr Sa
1 --:--
--
ON
--:--
TIMER
Program number
Turn-on indication

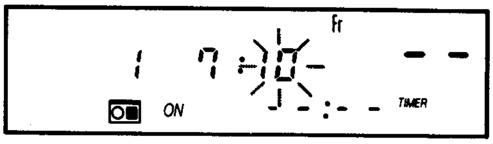
3 Set the day with the + or – button.


Fr
1 --:--
ON
TIMER

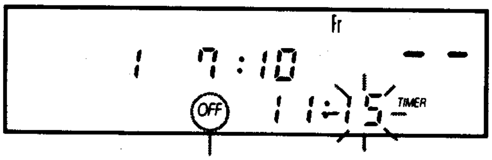
4 Press NEXT and set the turn-on hour with the + or – button.


Fr
1 7:--
ON
TIMER

5 Press NEXT and set the minute with the + or – button.

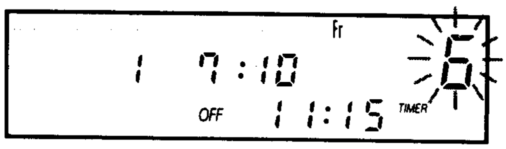

Fr
1 7:10
ON
TIMER

6 Press NEXT and set the turn-off time as in steps 4 and 5.


Fr
1 7:10
OFF
11:15
TIMER

Turn-off indication

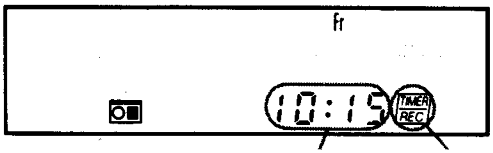
7 Press NEXT and set the program to be recorded with the + or – button.


Fr
1 7:10
6
OFF
11:15
TIMER

8 Press NEXT.
The tape counter and the current time will reappear.

To preset another program, press TIMER SET again and repeat steps 3 to 8. Up to 6 programs can be preset.

9 Press TIMER REC ON/OFF.
The power will be turned off and the recorder will enter the standby mode.



Current time Appears.

Recording will start at the preset time and will automatically stop when the recording is completed. The memory of the program except everyday and every week setting will be erased and the program positions preset in the timer will advance one by one.

NOTICE:
ONCE THE TIMER REC INDICATOR HAS LIT UP, only the functions of CHECK and TIMER REC ON/OFF on the recorder can be activated. To turn on the power again for the usual manual operations, press TIMER REC ON/OFF again so that the indicator turns off.

BEFORE THE TIMER-ACTIVATED RECORDING STARTS

To check the timer settings
Press CHECK. Every time you press CHECK, each program will be displayed.

To change the settings
1 Press TIMER REC ON/OFF. The TIMER REC indicator turns off.
2 Press CHECK to select the program to be changed.
3 Press TIMER SET.
4 Press NEXT until the item to be changed blinks.
5 Change the setting with the + or – button.
6 Press NEXT so that the tape counter and the current time appear.
7 Press TIMER REC ON/OFF again to reactivate the timer.

To record the entire tape
Set the turn-off time to exactly the same time as the turn-on time. Recording will continue to the end of the tape.

To erase the memory of a particular program
1 Press TIMER REC ON/OFF. The TIMER REC indicator turns off.
2 Press CHECK to select the program to be erased.
3 Press CLEAR/RESET. The memory of the program will be eliminated.
4 If other programs have been preset for recording, press TIMER REC ON/OFF again to reactivate the timer.

DURING RECORDING

To stop during the timer recording
Press TIMER REC ON/OFF. The recording will stop and the power will be turned off.

When the tape ends during timer recording
The tape stops but the tape will not be rewound to the beginning.

NOTES ON TIMER RECORDING

Troubles when TIMER REC ON/OFF is pressed

The cassette will be ejected automatically.	⇨	The cassette inserted has the safety tab removed.
TIMER REC does not appear in the window.	⇨	No cassette is inserted. The tape is at its end.

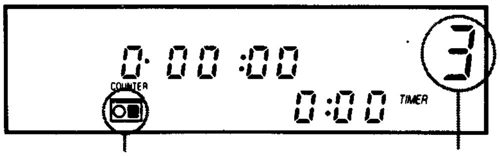
1-13. QUICK TIMER RECORDING

Use this function to begin recording a program immediately. You can start timer recording just by pressing QUICK TIMER. The recording duration can be set for up to 4 hours by 30 minutes. You can also use this function to stop the non-timer recording by presetting the recording duration.

TO USE QUICK TIMER FROM THE TAPE STOP MODE

Make sure that the cassete is inserted.

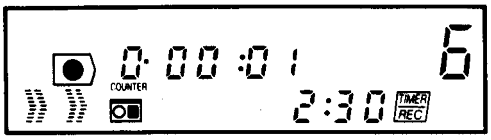
1 Press QUICK TIMER.
The power will be turned on.



Cassette is inserted. Program previously selected

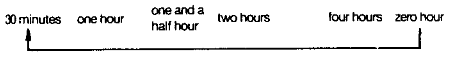
2 Choose the program to be recorded with the + or – button.
If you do not advance to the next step within 30 seconds. The power will be turned off.

3 Press QUICK TIMER so that the recording starts.
Now decide the recording duration.



Every time you press QUICK TIMER, the recording duration indication changes as follows:

0:30 → 1:00 → 1:30 → 2:00 ...... 4:00 → 0:00



When the recording starts, the duration indication decreases minute by minute to 0:00 and the power will be turned off automatically about 30 seconds after the recording has finished.

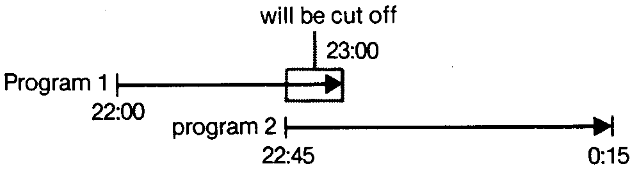
TO USE QUICK TIMER WHILE RECORDING

By pressing QUICK TIMER, you can set the duration so that the recording stops and power turns off after the preset duration.

Once the quick timer recording has started
Only the following function buttons can be activated:
QUICK TIMER......to change recording duration
TIMER REC ON/OFF......to interrupt quick timer recording
PAUSE ▮▮/▶◀......to stop quick timer recording momentarily
CHECK......to check timer programs preset

SPECIFIC NOTES ON TIMER-ACTIVATED RECORDINGS

When the presettings of your timer-activated recordings overlap
There will be no error indication to inform you of the overlap. Even if there is an overlap, a recording will be made.



The recording of program 2 will begin before program 1 is finished.

If a power interruption occurs during timer recording
If the clock shows "0:00" and blinks
When the recorder was in the standby mode, all the timer settings are erased. Reset the clock and timer setting. When the timer-recording was activated, the recording will stop.

1-14. CAMERA RECORDING

When connecting a Sony color video camera, the use of the Sony HVA-220CE AC adaptor is required. For details on connections, refer to the instruction manual furnished with the AC adaptor.

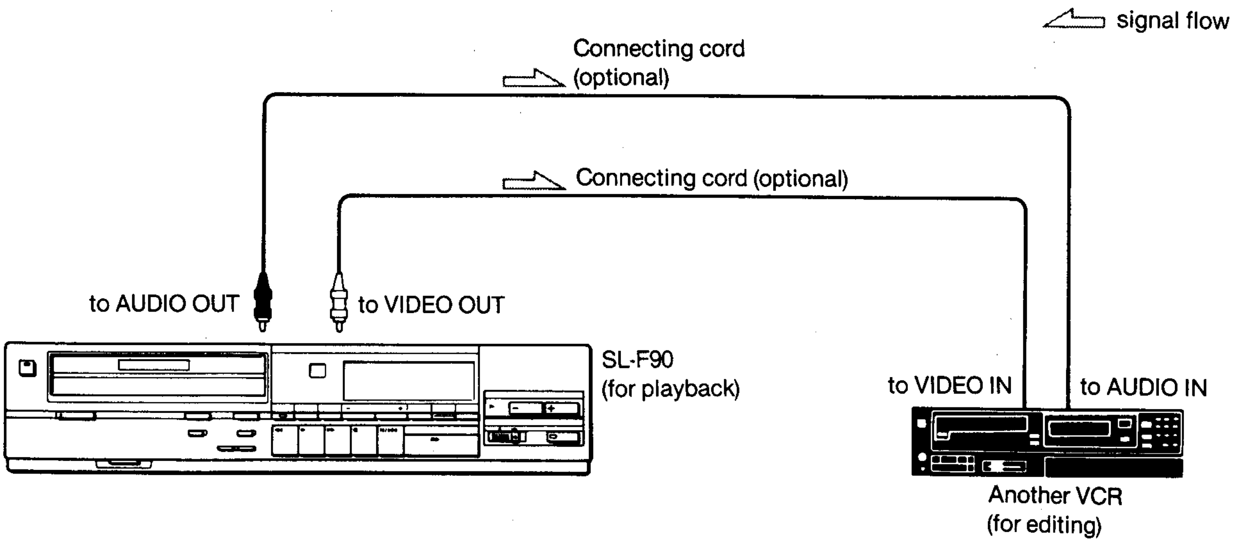
The camera must conform to CCIR PAL TV standards.

1-15. EDITING A TAPE

To edit a home movie tape, you need two video cassette recorders.
To start recording, set the VCR for playback in the playback mode, then press the record button on the other VCR.

Note
Avoid repetition of editing tapes, as the picture and tone quality will be impaired noticeably for newly edited tapes.

TO EDIT A HOME MOVIE TAPE FROM THE SL-F90 TO ANOTHER VCR


signal flow
Connecting cord (optional)
Connecting cord (optional)
to AUDIO OUT
to VIDEO OUT
SL-F90 (for playback)
to VIDEO IN
to AUDIO IN
Another VCR (for editing)

The impairment of the edited picture quality can be decreased by activating the SYNCHRO EDIT button as follows:
Set the SL-F90 to playback pause mode and press SYNCHRO EDIT to turn on the indicator on the button and start editing.

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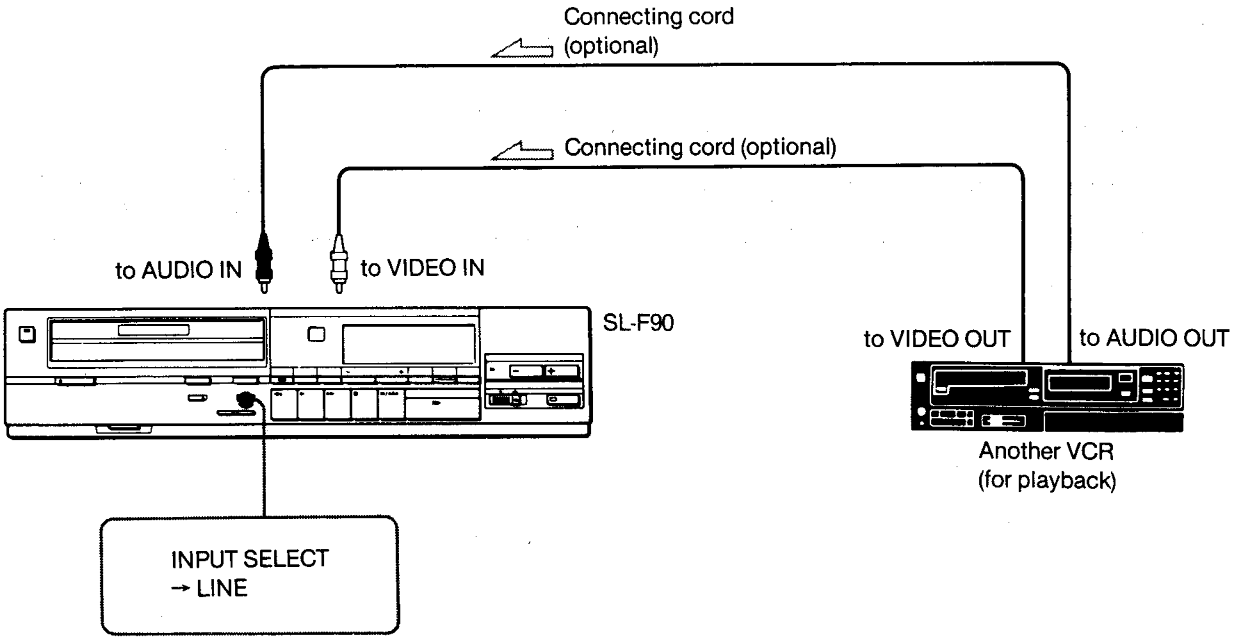
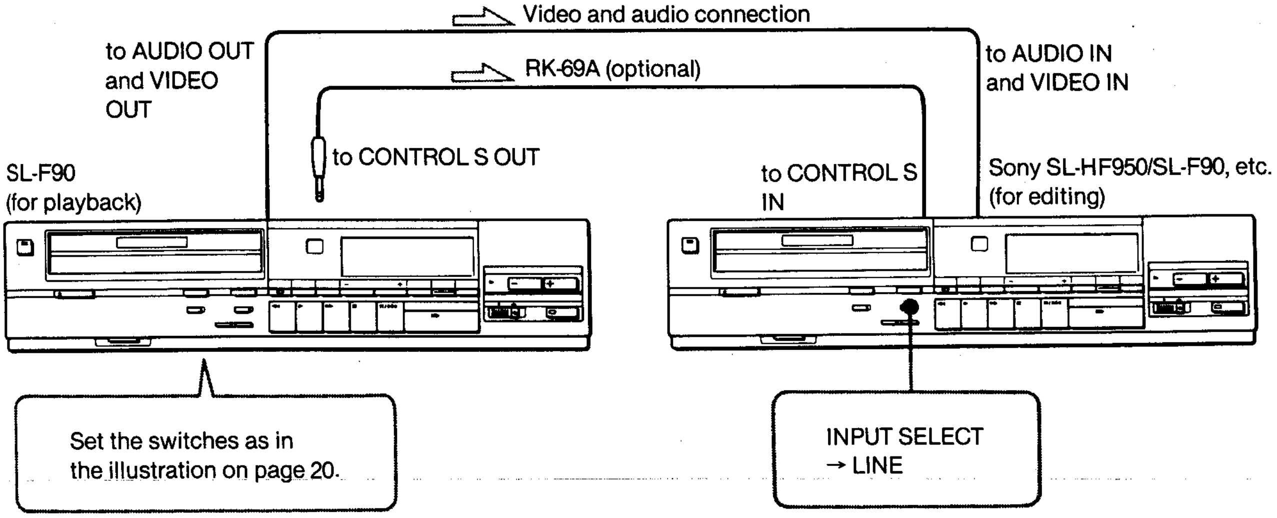
TO EDIT A HOME MOVIE TAPE FROM ANOTHER VCR TO THE SL-F90


Connecting cord (optional)
Connecting cord (optional)
to AUDIO IN
to VIDEO IN
SL-F90
to VIDEO OUT
to AUDIO OUT
Another VCR (for playback)
INPUT SELECT → LINE

SYNCHRO EDITING—Using a VCR equipped with the CONTROL S input

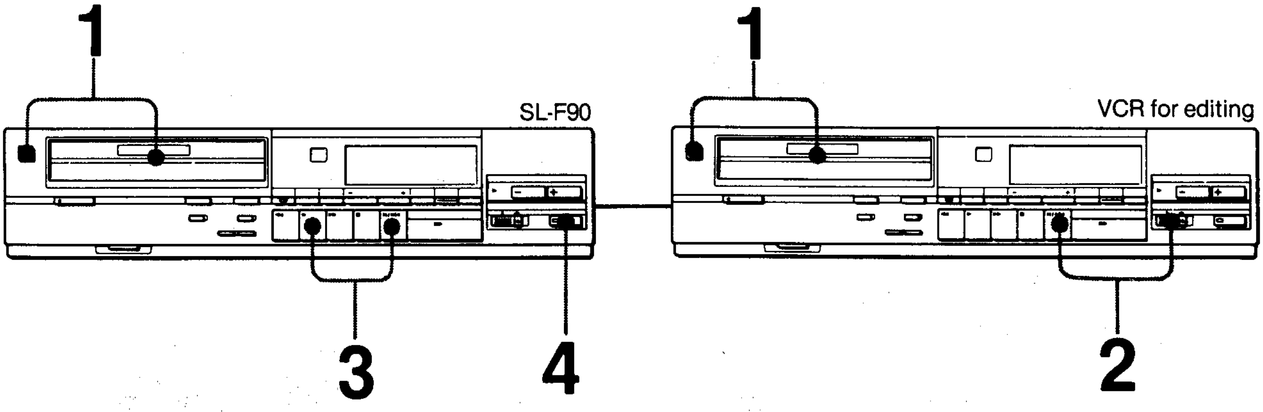
Connect the CONTROL S OUT jack of the SL-F90 to the CONTROL S input jack of another VCR. Recording start/stop on the other VCR can be activated in synchronization with playback start/stop on the SL-F90 simply by pressing the SYNCHRO EDIT button.

Connection and preparations


Video and audio connection
RK-69A (optional)
to AUDIO OUT and VIDEO OUT
to CONTROL S OUT
SL-F90 (for playback)
to CONTROL S IN
to AUDIO IN and VIDEO IN
Sony SL-HF950/SL-F90, etc. (for editing)
Set the switches as in the illustration on page 20.
INPUT SELECT → LINE

Note for owners of VCR equipped with the CONTROL S IN and OUT jacks
Avoid simultaneous connections to the CONTROL S IN and OUT jacks. This may cause malfunction of the VCRs.

Operation



1 Turn on the VCRs. Insert a recorded cassette on the SL-F90 and a cassette for recording on the other VCR.

2 Set the VCR for editing to recording pause mode.

3 Locate the portion of the tape at which you want to start editing and press ❚❚/▶◀.

4 Press SYNCHRO EDIT. The indicator on the button lights. The recording and playback will begin simultaneously on the respective VCRs.

To stop editing momentarily
Press SYNCHRO EDIT again. The indicator on the button goes off. The SL-F90 will enter playback pause mode, and the VCR for editing will enter recording pause mode.
(The pause mode will be automatically released after about 8 minutes and the tape will stop on the VCR for editing and playback will resume on the SL-F90).

To start editing of the next scene
Repeat steps 3 and 4.

To stop the tapes
Press the ■ STOP button on each VCR.

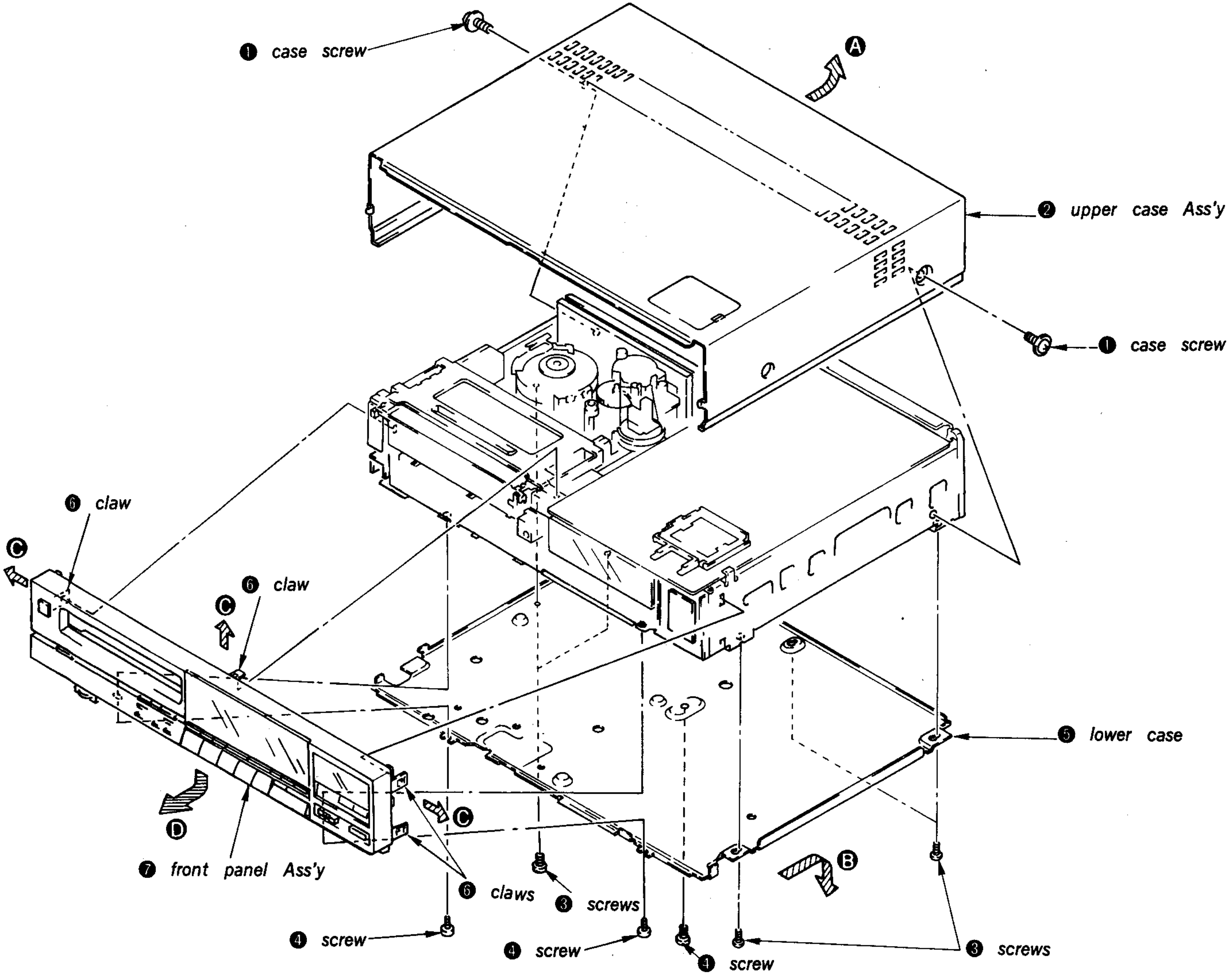
Note
- When SYNCHRO EDIT is pressed and the indicator on the button is lit, the video circuit is switched to editing mode. In this mode, better editing will result.
- If POWER is turned off or the ■ STOP button is pressed on the SL-F90, the editing VCR will enter recording pause mode.

Caution
Do not press any button on the VCRs or on the Remote Commander during editing, as synchro editing will malfunction.

SECTION 2
DISASSEMBLY

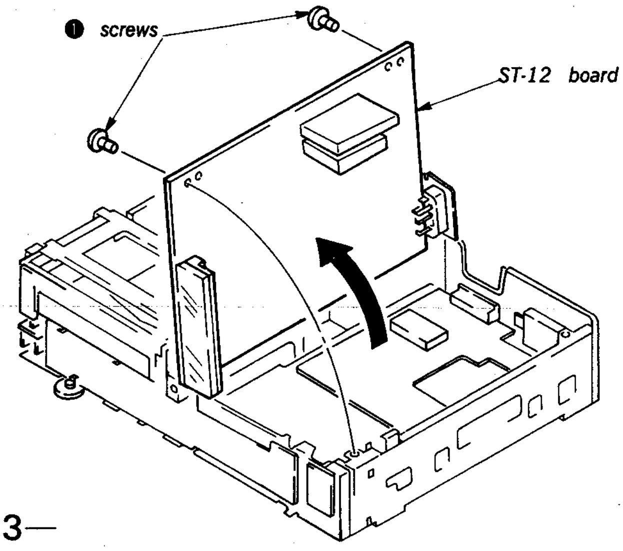
2-1. DISASSEMBLY OF CABINET

1) Remove the two case screws ❶.
2) Remove the upper case ❷ in the direction shown by the arrow Ⓐ.
3) Loosen the five screws ❸, then remove the three screws ❹.
4) Remove the lower case ❺ in the direction shown by the arrow Ⓑ.
5) Remove the four claws ❻ in the direction shown by the arrow Ⓒ.
6) Remove the front panel ❼ in the direction shown by the arrow Ⓓ.


❶ case screw
Ⓐ
❷ upper case Ass'y
❶ case screw
❻ claw
Ⓒ
❻ claw
Ⓒ
❺ lower case
Ⓒ
Ⓓ
❼ front panel Ass'y
❻ claws
❸ screws
Ⓑ
❹ screw
❹ screw
❹ screw
❸ screws

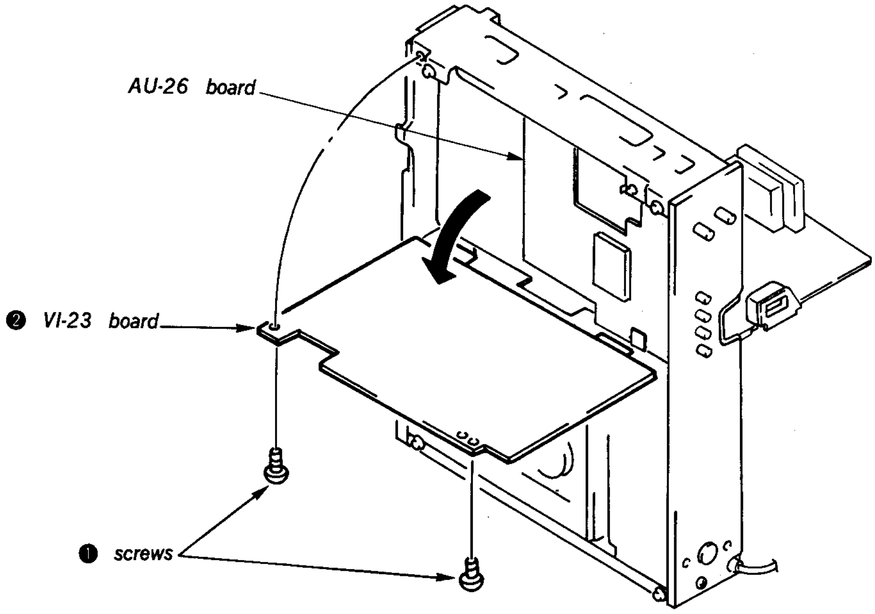
2-2. REMOVAL OF THE ST-12 BOARD

1) Remove the two screws ❶.
2) Remove the ST-12 board ❷ in the direction shown by the arrow.


❶ screws
ST-12 board

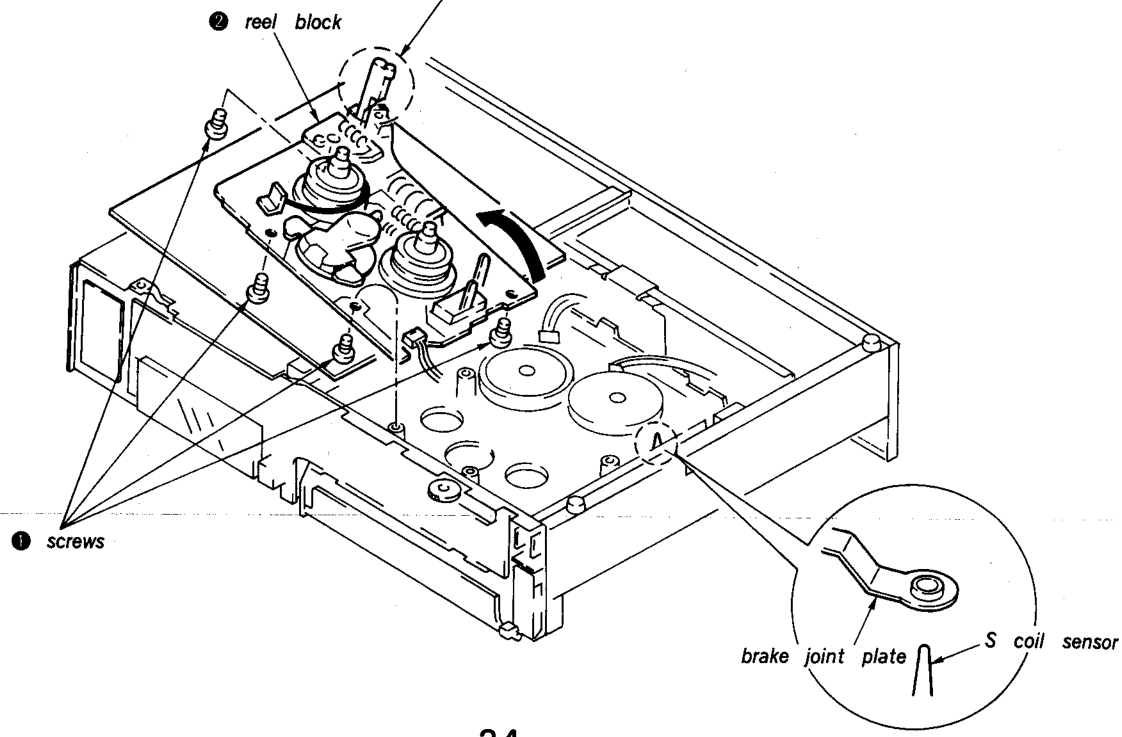
2-3. REMOVAL OF THE AU-26 BOARD AND THE VI-23 BOARD

1) Stand the set with the left side panel on the bottem.
2) Remove the two screws ❶.
3) Remove the VI-23 board ❷ in the direction shown by the arrow.
4) Remove the ST-12 board ❸.
   (Refer to section 2-2 for instructions on how to remove the ST-12 board.)


AU-26 board
❷ VI-23 board
❶ screws

2-4. REMOVAL OF THE REEL BLOCK ASSEMBLY

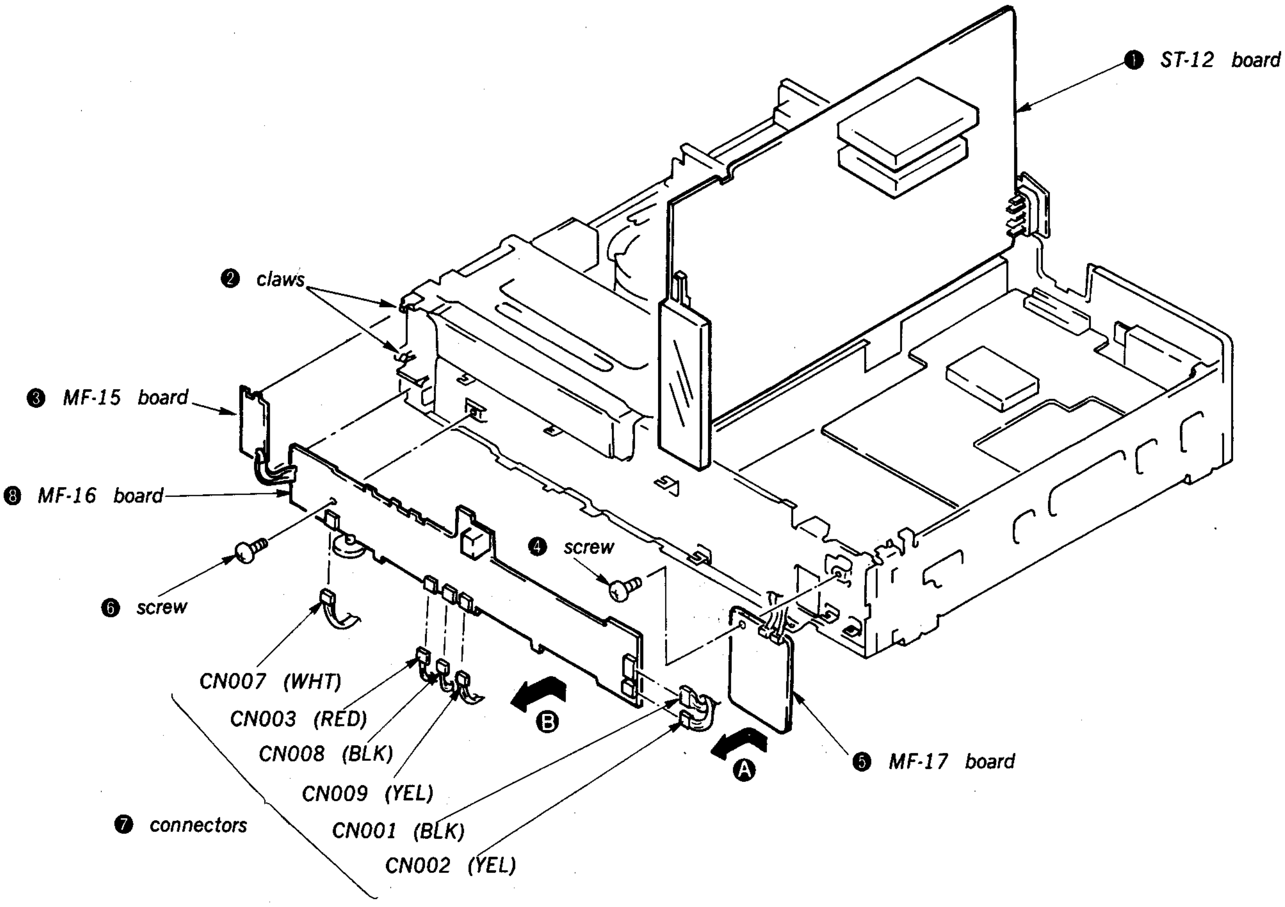
1) Place the set up side down.
2) Remove the four screws ❶.
3) Remove the reel block assembly ❷ in the direction shown by the arrow.


Be careful not to scratch the chassis when removing the tension regulator lever Ass'y

❷ reel block
❶ screws
A
brake joint plate
S coil sensor

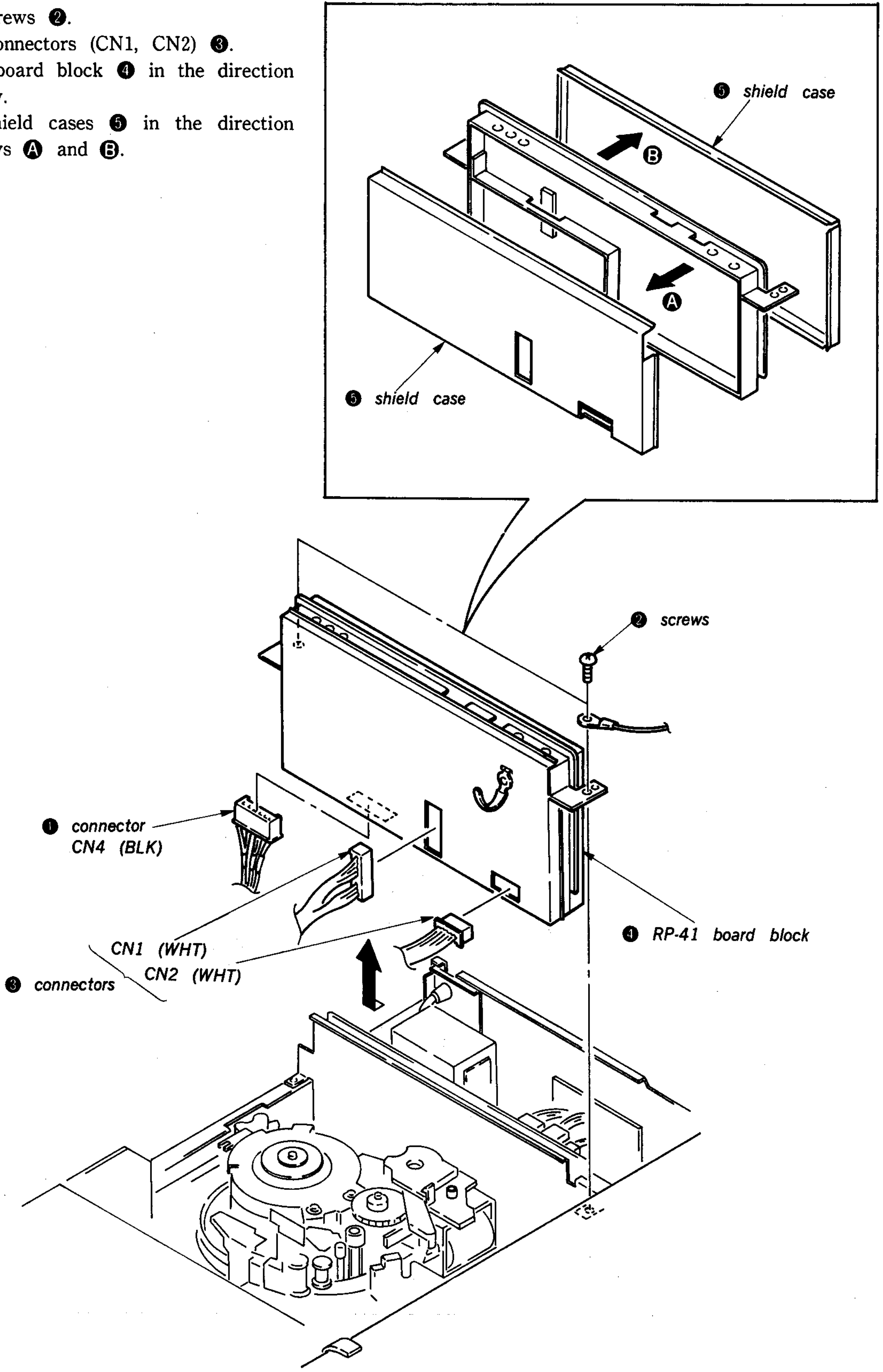
2-5. REMOVAL OF THE MF-17 BOARD AND THE MF-16 BOARD

1) Remove the ST-12 board ❶.
   (Refer to section 2-2 for instructions on how to remove the ST-12 board).
2) Remove the MF-15 board ❸ from the clows ❷.
3) Remove the screw ❹ than remove the MF-17 board ❺ in the direction shown by the arrow Ⓐ.
4) Remove the screw ❻.
5) Pull out the six connectors ❼ (CN001, CN002, CN003, CN007, CN008, CN009).
6) Remove the MF-16 board ❽ in the direction shown by the arrow Ⓑ.


❶ ST-12 board
❷ claws
❸ MF-15 board
❽ MF-16 board
❹ screw
❻ screw
CN007 (WHT)
CN003 (RED)
CN008 (BLK)
CN009 (YEL)
❼ connectors
CN001 (BLK)
CN002 (YEL)
Ⓑ
Ⓐ
❺ MF-17 board

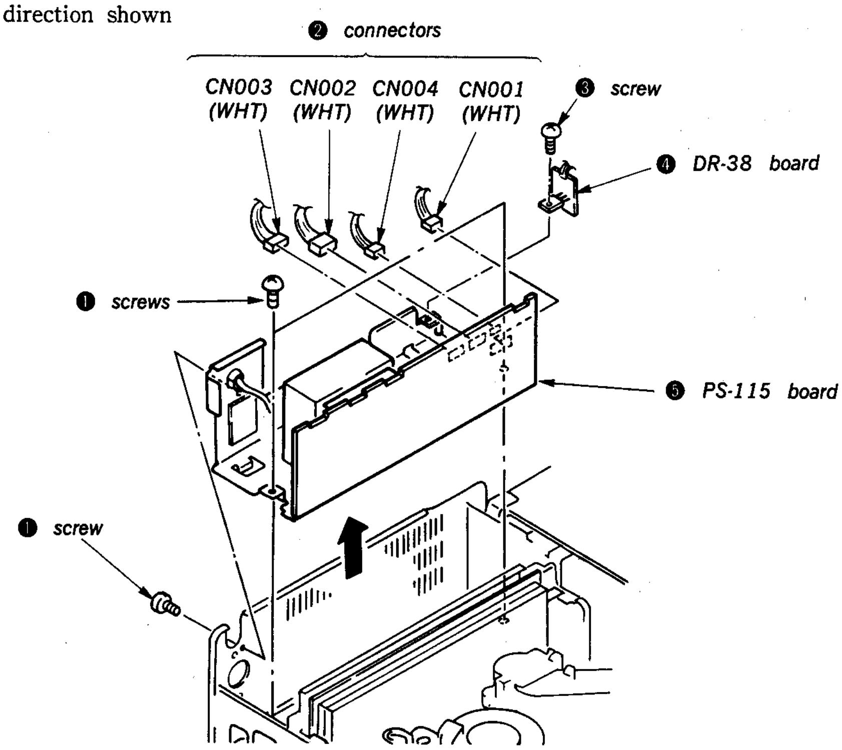
2-6. REMOVAL OF THE RP-41 BOARD

1) Pull out the connector CN4 ❶.
2) Remove the two screws ❷.
3) Pull out the two connectors (CN1, CN2) ❸.
4) Remove the RP-41 board block ❹ in the direction shown by the arrow.
5) Remove the two shield cases ❺ in the direction shown by the arrows Ⓐ and Ⓑ.


❺ shield case
Ⓑ
Ⓐ
❺ shield case
❷ screws
❶ connector CN4 (BLK)
CN1 (WHT)
CN2 (WHT)
❸ connectors
❹ RP-41 board block

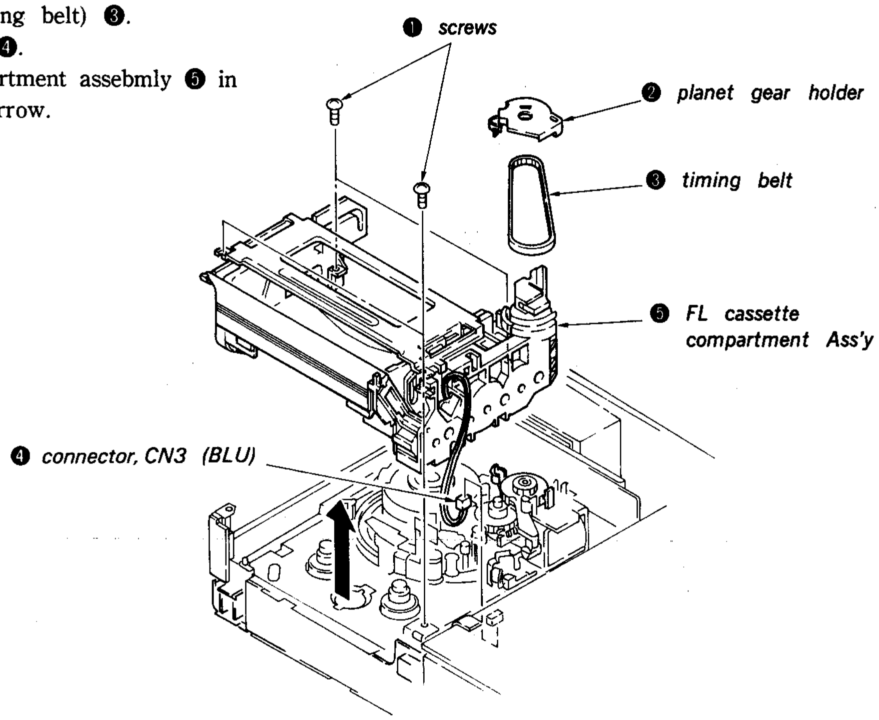
2-7. REMOVAL OF THE PS-115 BOARD

1) Remove the three screws ❶.
2) Pull out the four connectors ❷ (CN001, CN002, CN003, CN004).
3) Remove the screw ❸, then remove the DR-38 board ❹.
4) Remove the PS-115 board ❺ in the direction shown by the arrow.


❷ connectors
CN003 (WHT)
CN002 (WHT)
CN004 (WHT)
CN001 (WHT)
❸ screw
❹ DR-38 board
❶ screws
❺ PS-115 board
❶ screw

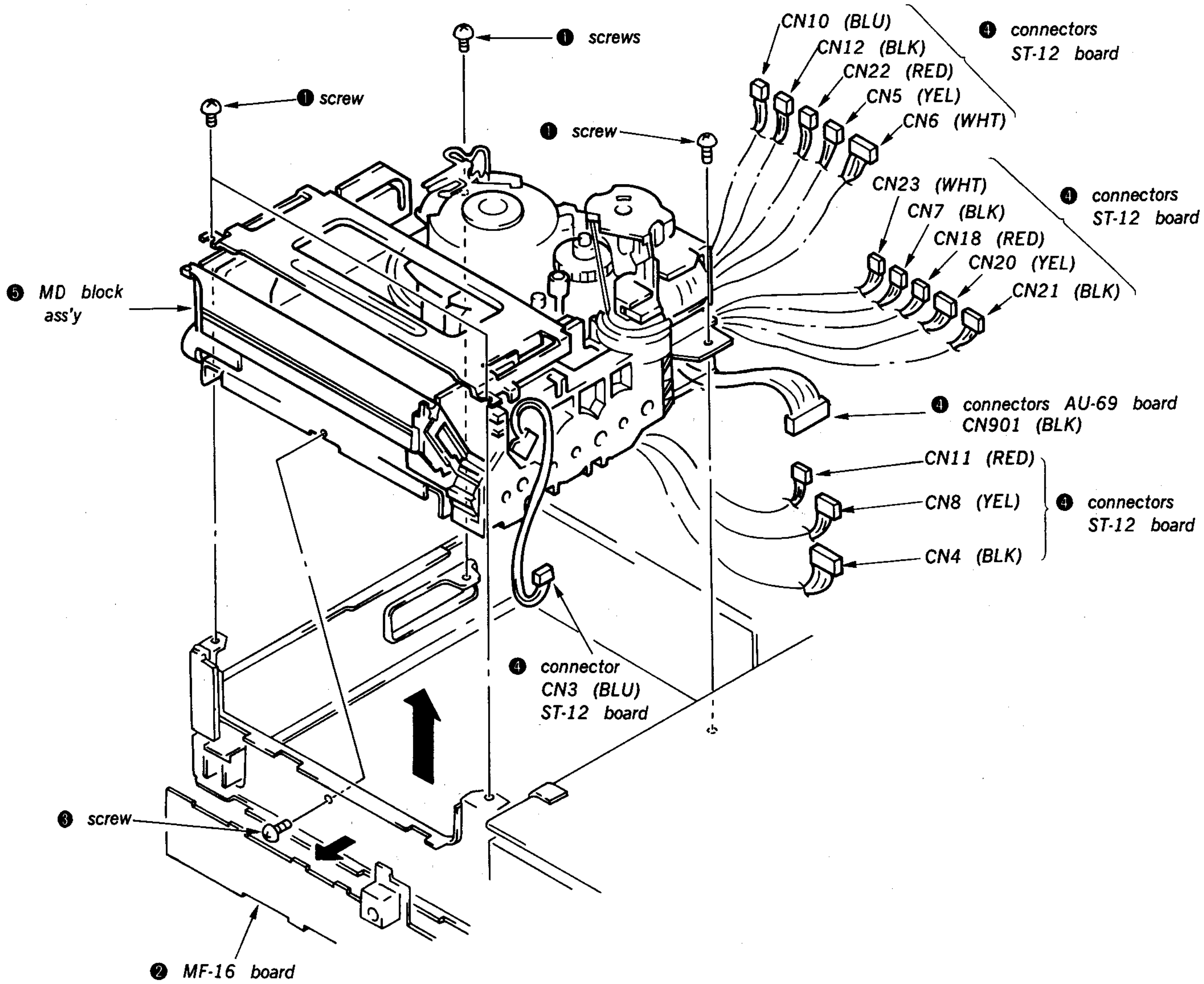
2-8. REMOVAL OF THE FL CASSETTE COMPARTMENT ASSEMBLY

1) Remove the four screws ❶.
2) Remove the pranet gear holder ❷.
3) Remove the timing belt (loading belt) ❸.
4) Pull out the connector, CN3 ❹.
5) Remove the FL cassette compartment assebmly ❺ in the direction shown by the arrow.


❶ screws
❷ planet gear holder
❸ timing belt
❺ FL cassette compartment Ass'y
❹ connector, CN3 (BLU)

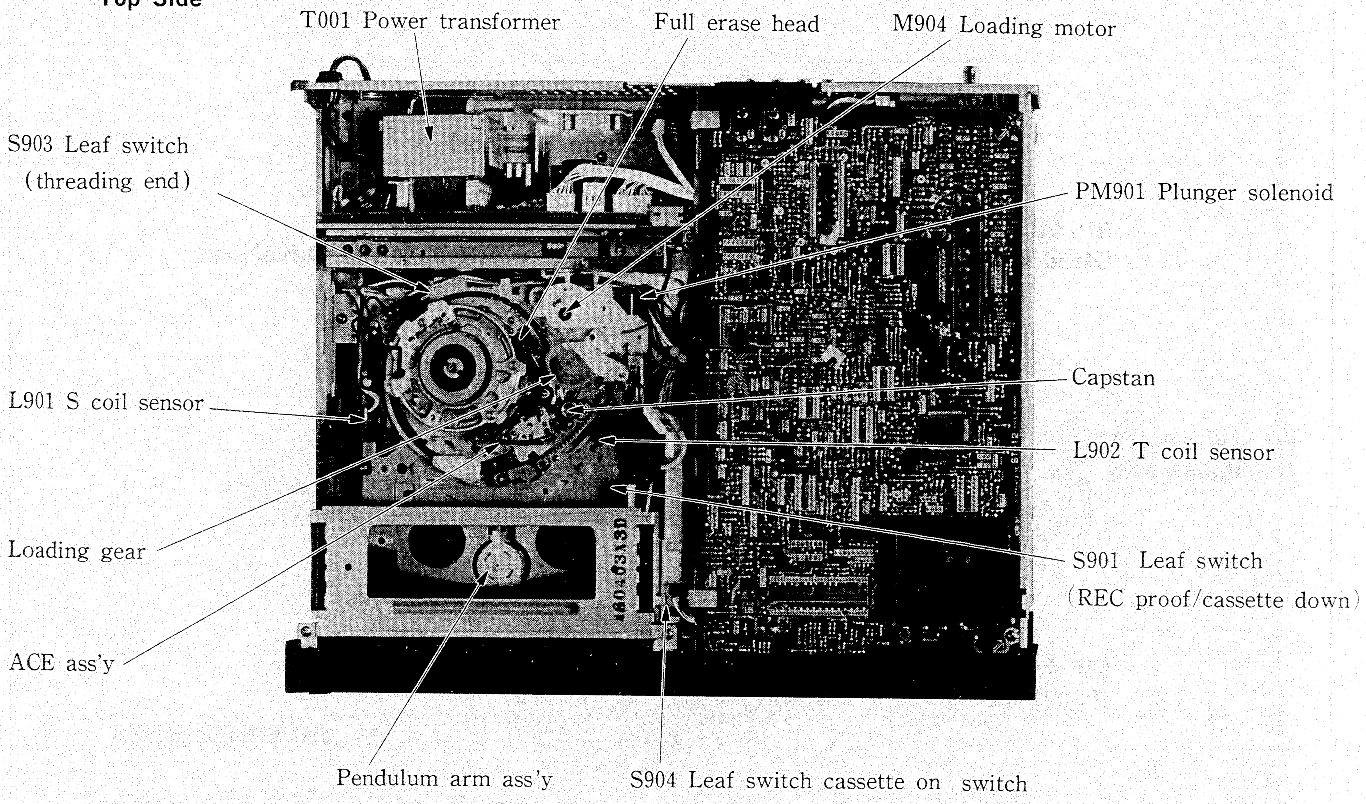
2-9. REMOVAL OF THE MD BLOCK ASSEMBLY

1) Remove the four screws ❶.
2) Remove the MF-16 board ❷.
   (Refer to section 2-5 for instructions on how to remove the MF-16 board)
3) Remove the screw ❸.
4) Pull out the sixteen connectors ❹ (ST-12 board: CN3, CN4, CN5, CN6, CN7, CN8, CN10, CN11, CN12, CN18, CN20, CN21, CN22, CN23) (AU-69 board: CN901).
5) Remove the MD complete assembly ❺ in the direction shown by the arrow.

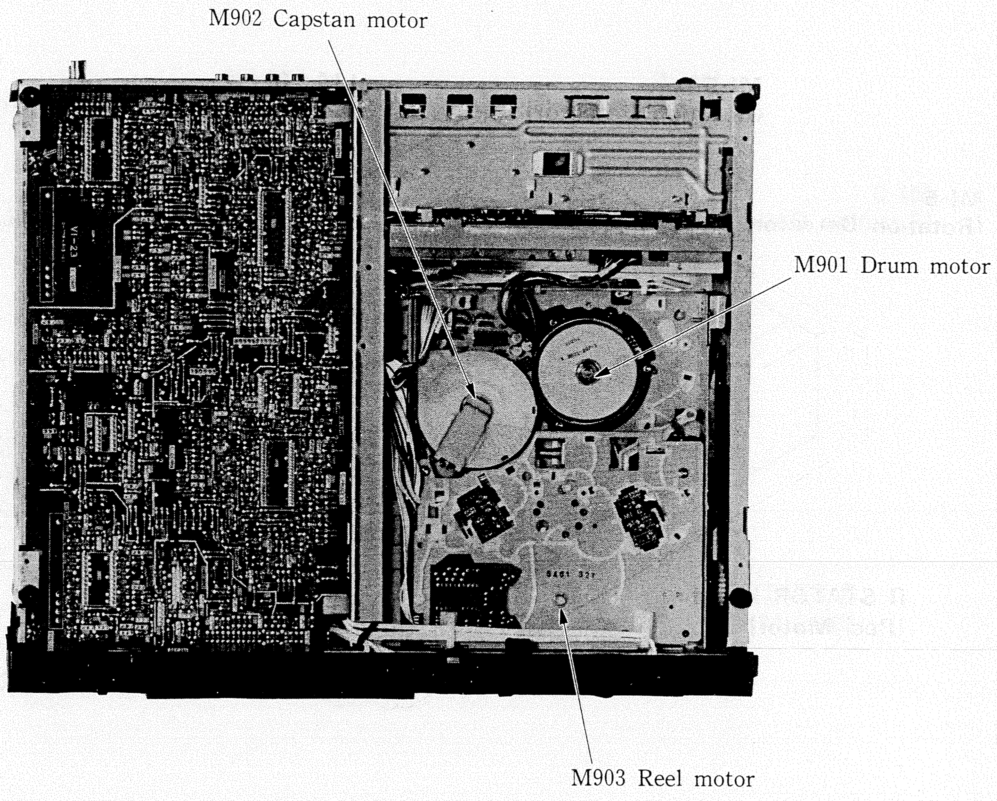

❶ screws
❶ screw
❶ screw
CN10 (BLU)
CN12 (BLK)
CN22 (RED)
CN5 (YEL)
CN6 (WHT)
❹ connectors ST-12 board
CN23 (WHT)
CN7 (BLK)
CN18 (RED)
CN20 (YEL)
CN21 (BLK)
❹ connectors ST-12 board
❺ MD block ass'y
❹ connectors AU-69 board CN901 (BLK)
CN11 (RED)
CN8 (YEL)
CN4 (BLK)
❹ connectors ST-12 board
❹ connector CN3 (BLU) ST-12 board
❸ screw
❷ MF-16 board

2-10. INTERNAL VIEWS

—**Top Side**—

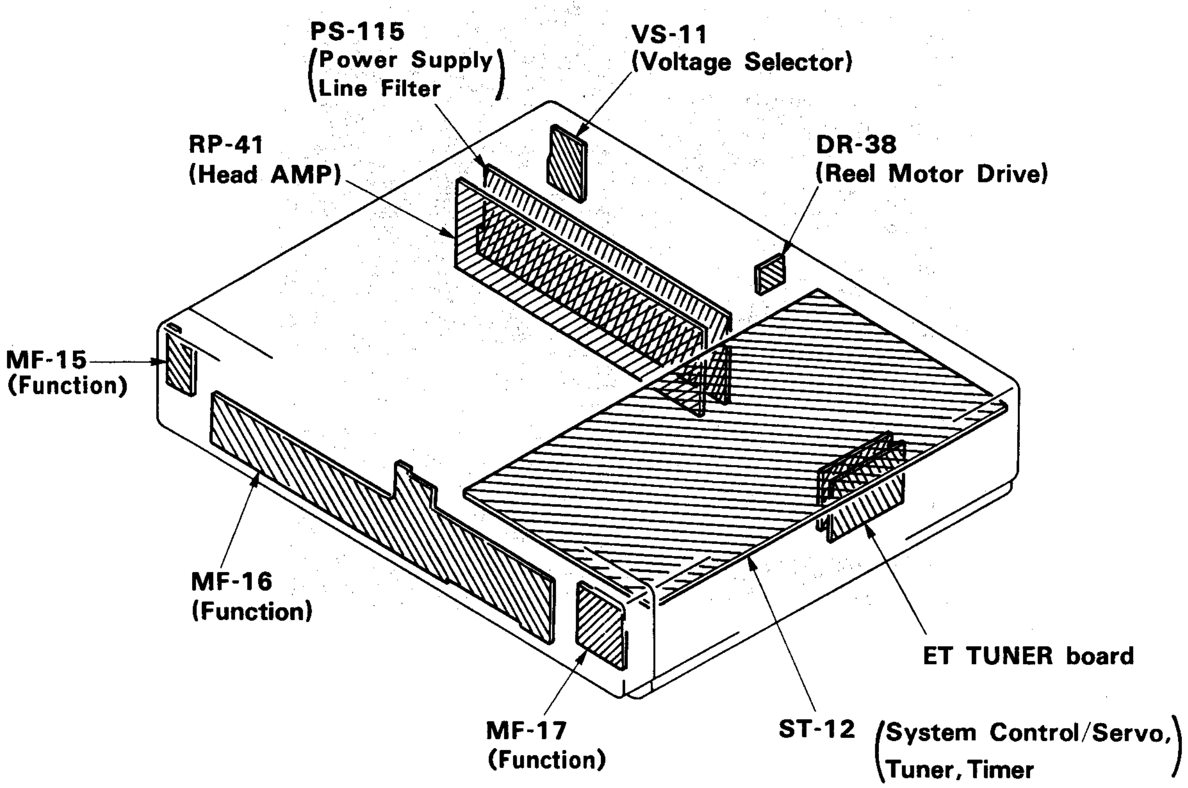

T001 Power transformer
Full erase head
M904 Loading motor
S903 Leaf switch (threading end)
PM901 Plunger solenoid
L901 S coil sensor
Capstan
L902 T coil sensor
Loading gear
S901 Leaf switch (REC proof/cassette down)
ACE ass'y
Pendulum arm ass'y
S904 Leaf switch cassette on switch

—**Bottom Side**—

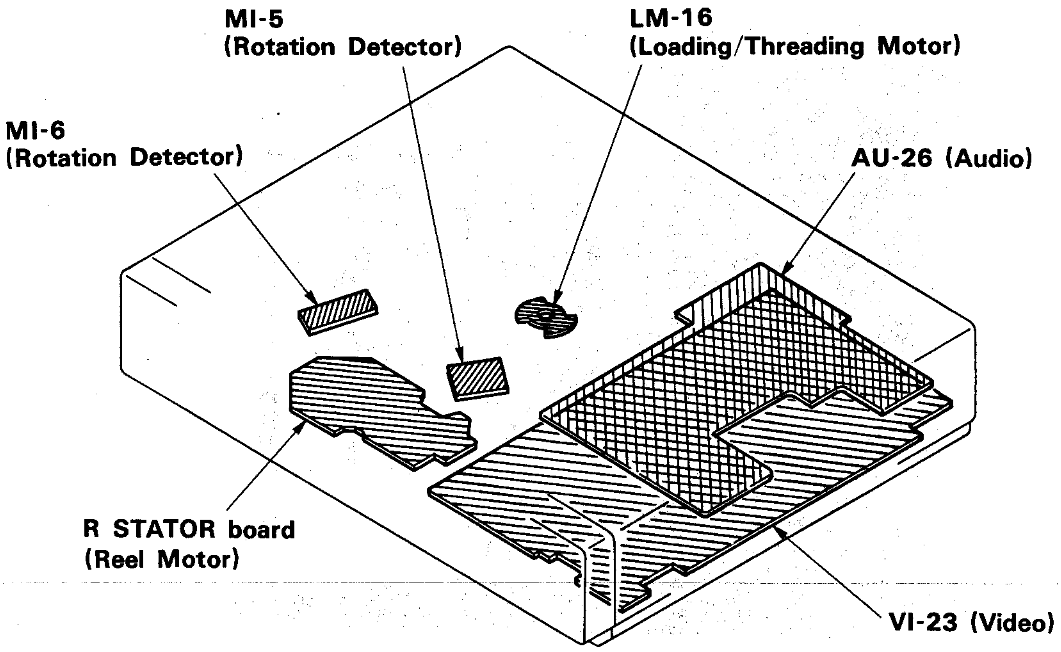

M902 Capstan motor
M901 Drum motor
M903 Reel motor

SECTION 3
BLOCK DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION

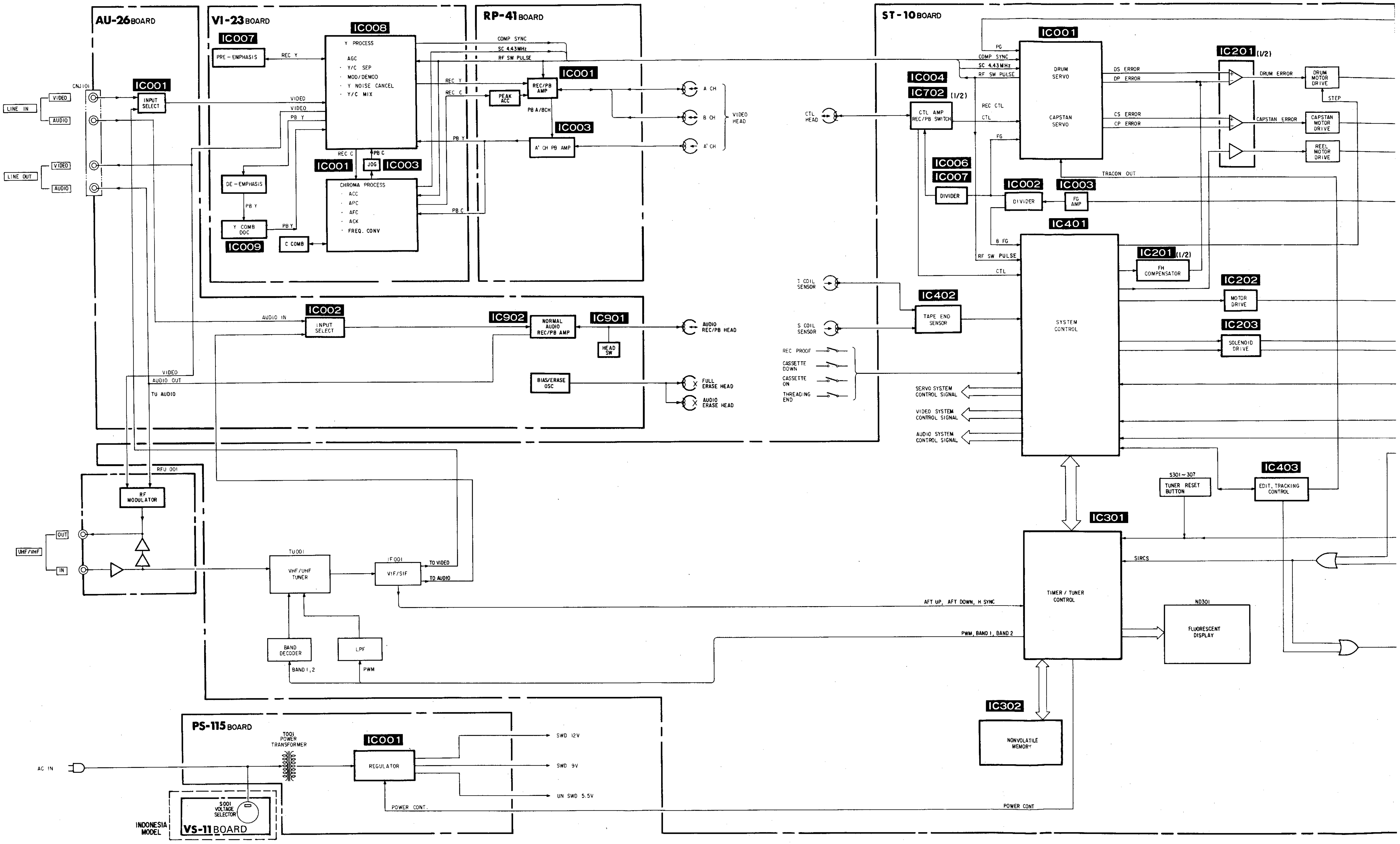


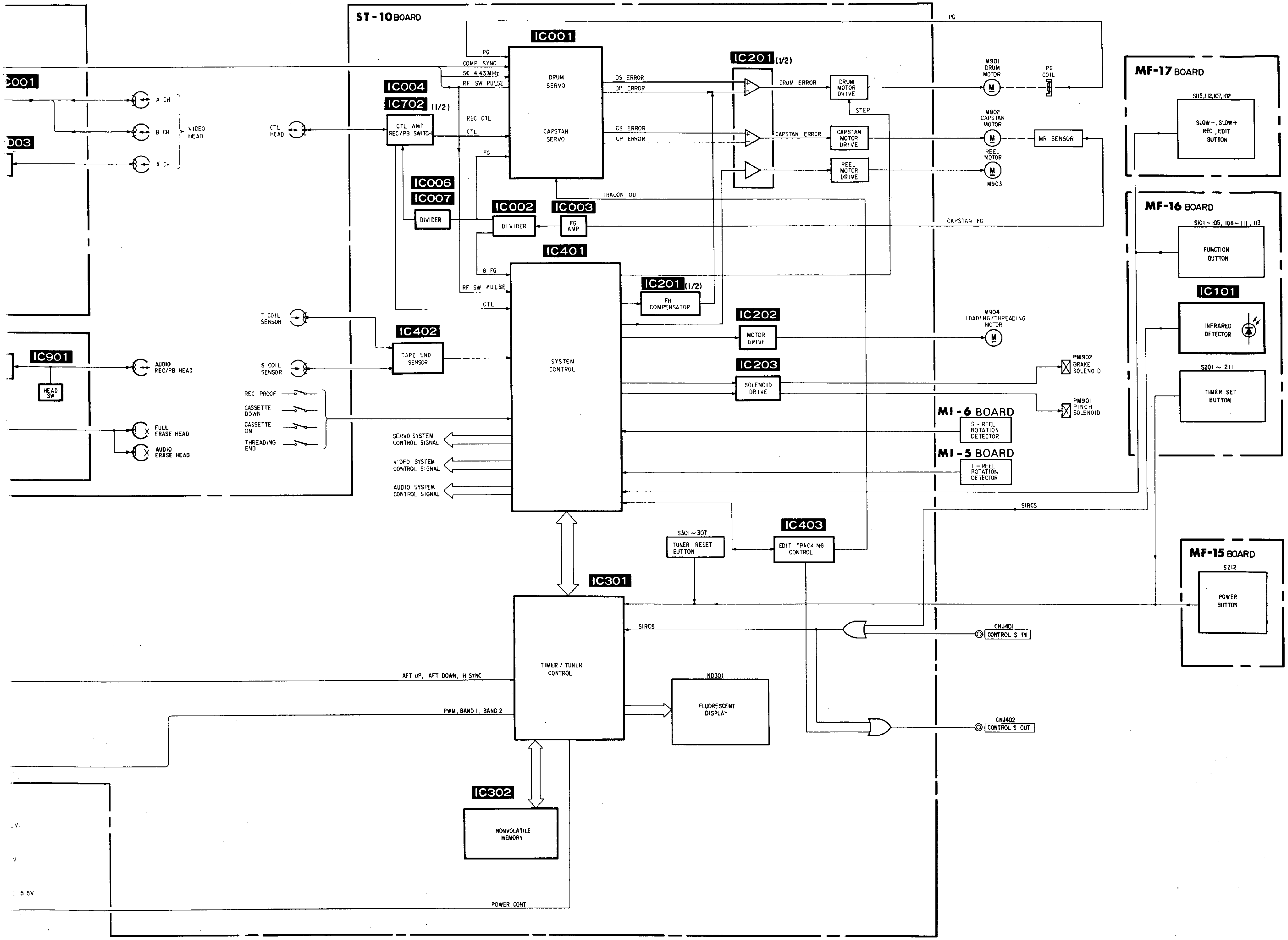
PS-115
(Power Supply Line Filter)
VS-11
(Voltage Selector)
RP-41
(Head AMP)
DR-38
(Reel Motor Drive)
MF-15
(Function)
MF-16
(Function)
ET TUNER board
MF-17
(Function)
ST-12
(System Control/Servo, Tuner, Timer)



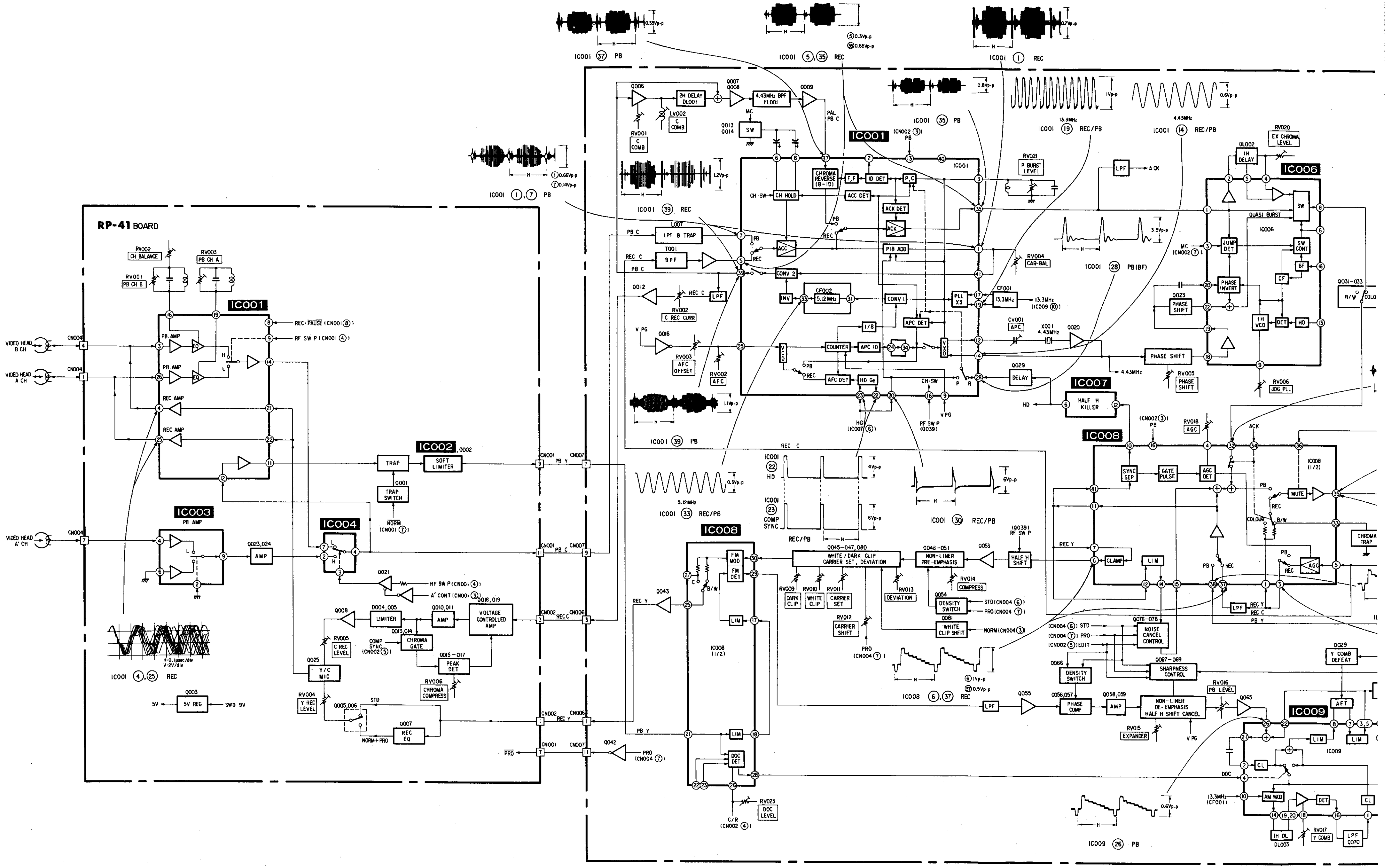
MI-5
(Rotation Detector)
LM-16
(Loading/Threading Motor)
MI-6
(Rotation Detector)
AU-26 (Audio)
R STATOR board
(Reel Motor)
VI-23 (Video)

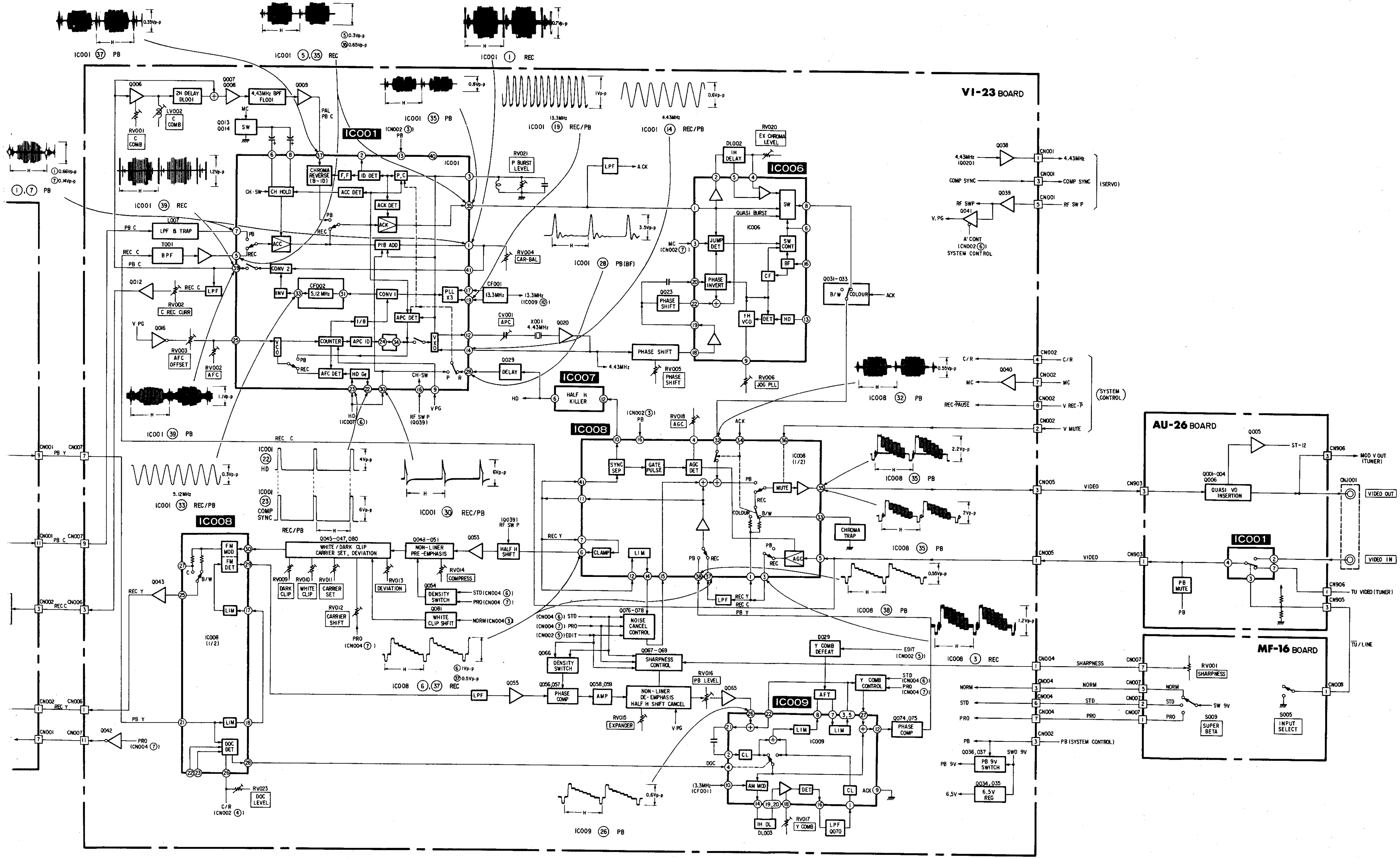
3-2. OVERALL BLOCK DIAGRAM


AU-26 BOARD
VI-23 BOARD
RP-41 BOARD
ST-10 BOARD
PS-115 BOARD
VS-11 BOARD
INDONESIA MODEL
CNJ101
LINE IN
VIDEO
AUDIO
LINE OUT
IC001
INPUT SELECT
IC007
PRE-EMPHASIS
REC Y
IC008
Y PROCESS
AGC
Y/C SEP
MOD/DEMOD
Y NOISE CANCEL
Y/C MIX
PB Y
REC C
PB C
JOG
IC003
DE-EMPHASIS
Y COMB DOC
IC009
C COMB
CHROMA PROCESS
ACC
APC
AFC
ACK
FREQ. CONV
COMP SYNC
SC 4.43MHz
RF SW PULSE
PEAK ACC
REC/PB AMP
PB A/BCH
A' CH PB AMP
A CH
B CH
A' CH
VIDEO HEAD
IC002
AUDIO IN
INPUT SELECT
IC902
NORMAL AUDIO REC/PB AMP
IC901
HEAD SW
AUDIO REC/PB HEAD
BIAS/ERASE OSC
FULL ERASE HEAD
AUDIO ERASE HEAD
VIDEO
AUDIO OUT
TU AUDIO
RFU 001
RF MODULATOR
UHF/VHF
OUT
IN
TU001
VHF/UHF TUNER
IF001
VIF/SIF
TO VIDEO
TO AUDIO
BAND DECODER
LPF
BAND 1, 2
PWM
T001 POWER TRANSFORMER
S001 VOLTAGE SELECTOR
AC IN
REGULATOR
SWD 12V
SWD 9V
UN SWD 5.5V
POWER CONT.
CTL HEAD
IC004
IC702 (1/2)
CTL AMP REC/PB SWITCH
FG
PG
DRUM SERVO
CAPSTAN SERVO
REC CTL
CTL
DS ERROR
DP ERROR
CS ERROR
CP ERROR
IC201 (1/2)
DRUM ERROR
CAPSTAN ERROR
DRUM MOTOR DRIVE
CAPSTAN MOTOR DRIVE
REEL MOTOR DRIVE
STEP
TRACON OUT
IC006
IC007
DIVIDER
IC002
IC003
FG AMP
IC401
8 FG
FH COMPENSATOR
SYSTEM CONTROL
T COIL SENSOR
S COIL SENSOR
IC402
TAPE END SENSOR
REC PROOF
CASSETTE DOWN
CASSETTE ON
THREADING END
SERVO SYSTEM CONTROL SIGNAL
VIDEO SYSTEM CONTROL SIGNAL
AUDIO SYSTEM CONTROL SIGNAL
IC202
MOTOR DRIVE
IC203
SOLENOID DRIVE
IC403
EDIT, TRACKING CONTROL
S301 ~ 307
TUNER RESET BUTTON
IC301
TIMER / TUNER CONTROL
SIRCS
AFT UP, AFT DOWN, H SYNC
PWM, BAND 1, BAND 2
ND301
FLUORESCENT DISPLAY
IC302
NONVOLATILE MEMORY
POWER CONT

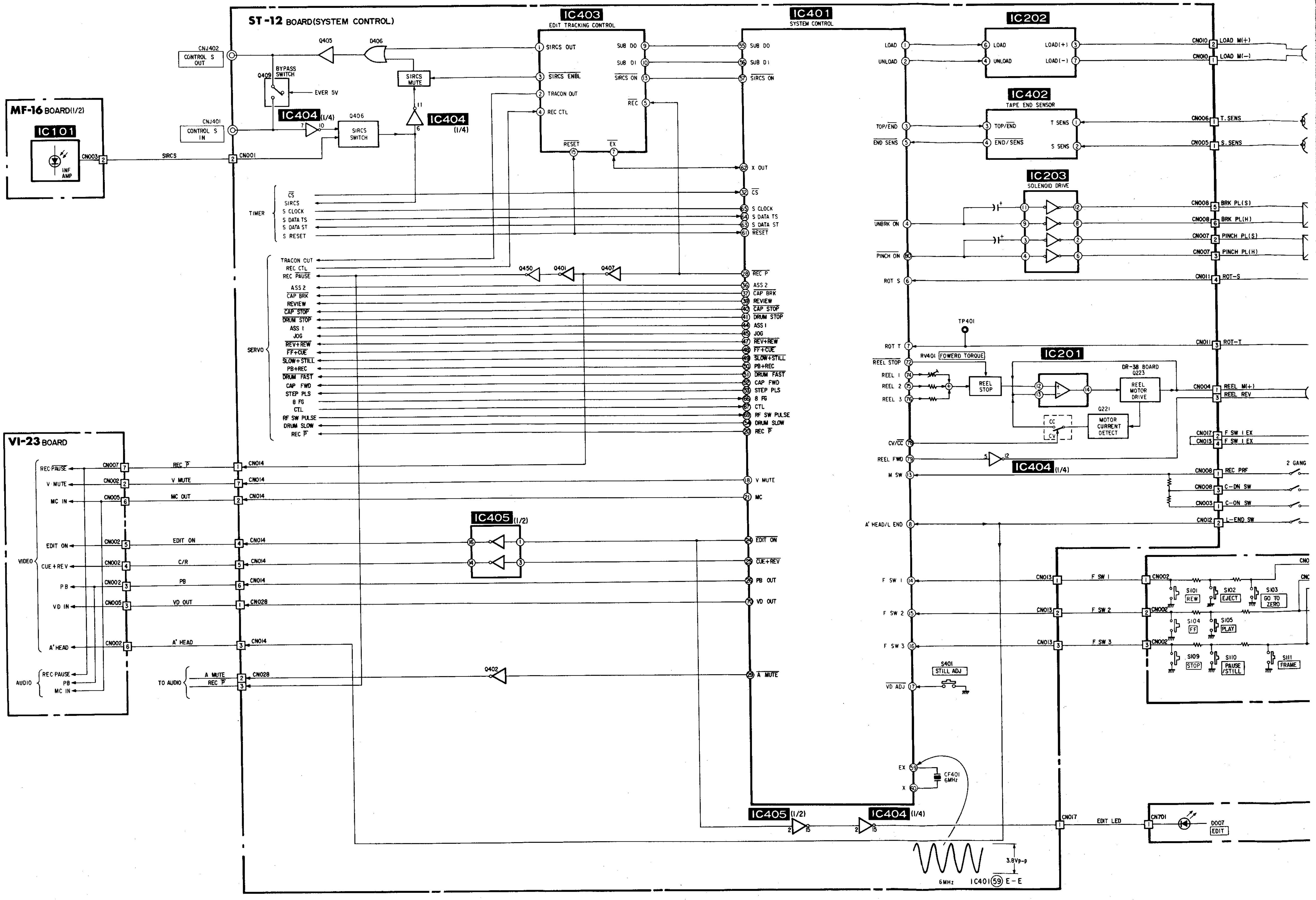

ST-10 BOARD
IC001
DRUM SERVO
CAPSTAN SERVO
PG
COMP SYNC
SC 4.43MHz
RF SW PULSE
REC CTL
CTL
FG
DS ERROR
DP ERROR
CS ERROR
CP ERROR
IC201 (1/2)
DRUM ERROR
CAPSTAN ERROR
DRUM MOTOR DRIVE
CAPSTAN MOTOR DRIVE
REEL MOTOR DRIVE
STEP
M901 DRUM MOTOR
PG COIL
M902 CAPSTAN MOTOR
MR SENSOR
REEL MOTOR
M903
CAPSTAN FG
TRACON OUT
IC004
IC702 (1/2)
CTL AMP REC/PB SWITCH
IC006
IC007
DIVIDER
IC002
DIVIDER
IC003
FG AMP
IC401
SYSTEM CONTROL
8 FG
RF SW PULSE
CTL
IC201 (1/2)
FH COMPENSATOR
IC202
MOTOR DRIVE
M904 LOADING/THREADING MOTOR
IC203
SOLENOID DRIVE
PM902 BRAKE SOLENOID
PM901 PINCH SOLENOID
MI-6 BOARD
S-REEL ROTATION DETECTOR
MI-5 BOARD
T-REEL ROTATION DETECTOR
IC402
TAPE END SENSOR
T COIL SENSOR
S COIL SENSOR
REC PROOF
CASSETTE DOWN
CASSETTE ON
THREADING END
SERVO SYSTEM CONTROL SIGNAL
VIDEO SYSTEM CONTROL SIGNAL
AUDIO SYSTEM CONTROL SIGNAL
CTL HEAD
A CH
B CH
A' CH
VIDEO HEAD
C001
003
IC901
HEAD SW
AUDIO REC/PB HEAD
FULL ERASE HEAD
AUDIO ERASE HEAD
S301 ~ 307
TUNER RESET BUTTON
IC403
EDIT, TRACKING CONTROL
SIRCS
IC301
TIMER / TUNER CONTROL
SIRCS
CNJ401
CONTROL S IN
CNJ402
CONTROL S OUT
AFT UP, AFT DOWN, H SYNC
PWM, BAND 1, BAND 2
ND301
FLUORESCENT DISPLAY
IC302
NONVOLATILE MEMORY
POWER CONT
V
V
5.5V
MF-17 BOARD
S115, 112, 107, 102
SLOW −, SLOW + REC, EDIT BUTTON
MF-16 BOARD
S101 ~ 105, 108 ~ 111, 113
FUNCTION BUTTON
IC101
INFRARED DETECTOR
S201 ~ 211
TIMER SET BUTTON
MF-15 BOARD
S212
POWER BUTTON
M

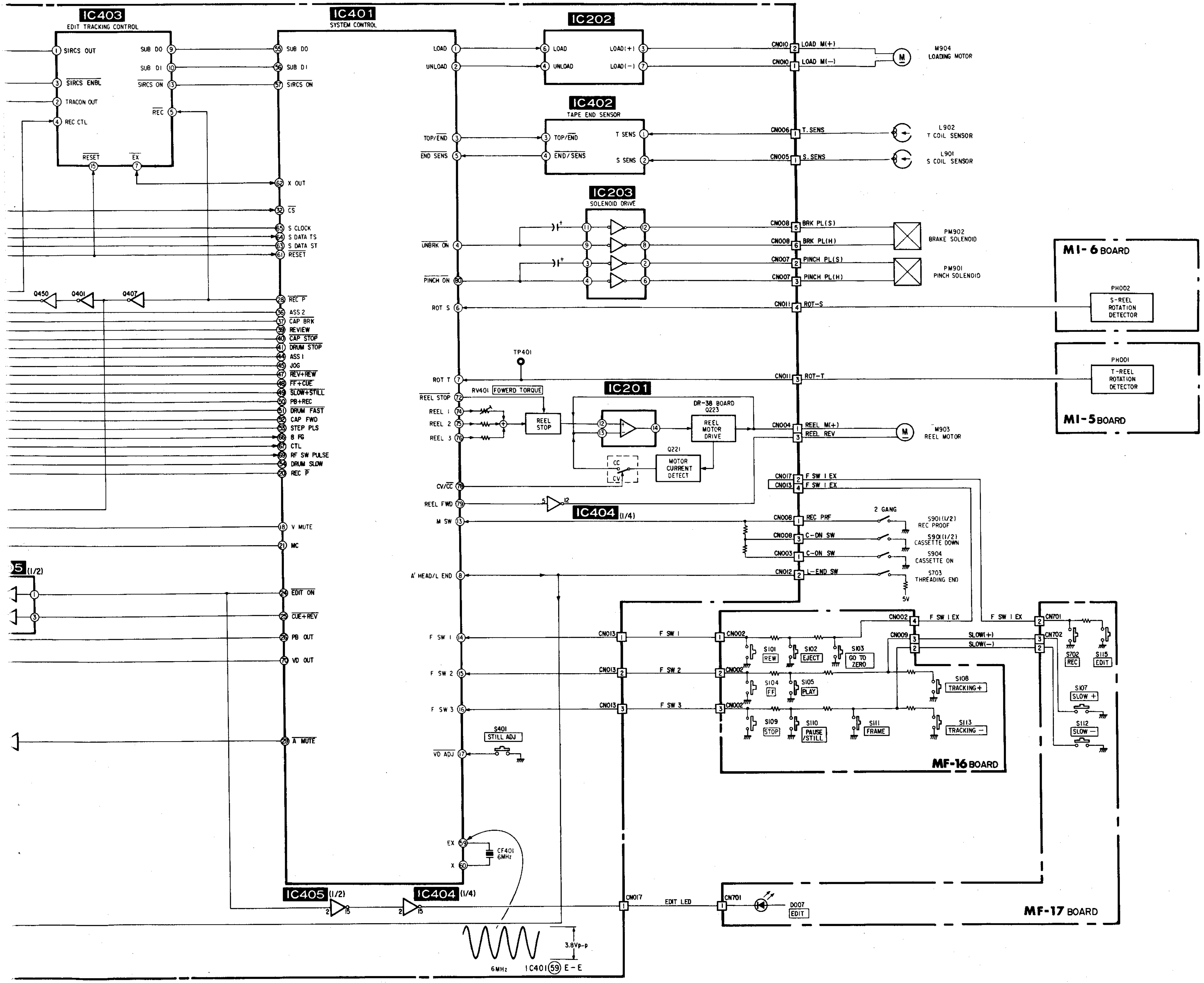
3-3. VIDEO BLOCK DIAGRAM


RP-41 BOARD
IC001
IC002
IC003
IC004
IC006
IC007
IC008
IC009
VIDEO HEAD B CH
VIDEO HEAD A CH
VIDEO HEAD A' CH
CN004
RV001 PB CH B
RV002 CH BALANCE
RV003 PB CH A
PB AMP
REC AMP
EQ
REC·PAUSE (CN001 ⑧)
RF SW P (CN001 ④)
TRAP
SOFT LIMITER
Q001 TRAP SWITCH
NORM (CN001 ⑦)
Q023,024 AMP
Q021
RF SW P (CN001 ④)
A' CONT (CN001 ③)
Q008
D004,005 LIMITER
Q010,011 AMP
Q018,019 VOLTAGE CONTROLLED AMP
Q013,014 CHROMA GATE
COMP SYNC (CN002 ⑤)
Q015-017 PEAK DET
RV006 CHROMA COMPRESS
RV005 C REC LEVEL
Q025 Y/C MIC
RV004 Y REC LEVEL
Q005,006
STD
NORM+PRO
Q007 REC EQ
Q003 5V REG
5V
SWD 9V
IC001 ④,㉕ REC
H 0.1μsec/div
V 2V/div
CN001
CN007
CN002
CN006
PB Y
PB C
REC C
REC Y
PRO
Q042
PRO (CN004 ⑦)
IC001 ①,⑦ PB
①0.66Vp-p
⑦0.14Vp-p
IC001 ㊲ PB
0.35Vp-p
IC001 ⑤,㉟ REC
⑤0.3Vp-p
㉟0.65Vp-p
IC001 ① REC
0.7Vp-p
Q006
2H DELAY DL001
LV002 C COMB
RV001 C COMB
Q007 Q008
4.43MHz BPF FL001
Q009
Q013 Q014
MC
SW
PAL PB C
CHROMA REVERSE (B-ID)
F.F
ID DET
P.C
CH HOLD
ACC DET
ACK DET
ACK
ACC
PIB ADD
CONV 2
CONV 1
INV
CF002 5.12MHz
1/8
APC DET
PLL X3
VXO
COUNTER
APC ID
AFC DET
HD Ge
CH·SW
L007 LPF & TRAP
T001 BPF
IC001 ㊴ REC
1.2Vp-p
Q012
REC C
LPF
RV002 C REC CURR
V PG
Q016
RV003 AFC OFFSET
RV002 AFC
IC001 ㊴ PB
1.1Vp-p
HD (IC007 ⑥)
RF SW P (IO039)
V PG
IC001 ㉟ PB
0.8Vp-p
(CN002 ③) PB
IC001 ⑲ REC/PB
13.3MHz
1Vp-p
IC001 ⑭ REC/PB
4.43MHz
0.6Vp-p
RV021 P BURST LEVEL
RV004 CAR-BAL
CF001 13.3MHz
13.3MHz (IC009 ⑩)
CV001 APC
X001 4.43MHz
Q020
Q029 DELAY
4.43MHz
HALF H KILLER
HD
IC001 ㉘ PB(BF)
3.5Vp-p
LPF
ACK
RV020 EX CHROMA LEVEL
DL002 1H DELAY
SW
QUASI BURST
JUMP DET
SW CONT
BF
CF
PHASE INVERT
FH VCO
DET
HD
MC (CN002 ⑦)
Q023 PHASE SHIFT
PHASE SHIFT
RV005 PHASE SHIFT
RV006 JOG PLL
Q031-033
B/W COLOR
IC001 ㉒ HD
4Vp-p
IC001 ㉓ COMP SYNC
6Vp-p
REC/PB
0.3Vp-p
5.12MHz
IC001 ㉝ REC/PB
IC001 ㉚ REC/PB
6Vp-p
(IO039) RF SW P
Q043
REC Y
FM MOD
FM DET
LIM
DOC DET
IC008 (1/2)
B/W
C
RV023 DOC LEVEL
C/R (CN002 ④)
Q045-047,080 WHITE/DARK CLIP CARRIER SET, DEVIATION
RV009 DARK CLIP
RV010 WHITE CLIP
RV011 CARRIER SET
RV012 CARRIER SHIFT
PRO (CN004 ⑦)
Q048-051 NON-LINER PRE-EMPHASIS
RV013 DEVIATION
RV014 COMPRESS
Q053
HALF H SHIFT
Q054 DENSITY SWITCH
STD (CN004 ⑥)
PRO (CN004 ⑦)
Q081 WHITE CLIP SHIFT
NORM (CN004 ③)
IC008 ⑥,㊲ REC
⑥1Vp-p
㊲0.5Vp-p
(CN002 ③) PB
RV018 AGC
SYNC SEP
GATE PULSE
AGC DET
MUTE
IC008 (1/2)
CLAMP
LIM
AGC
COLOUR
B/W
PB
REC
CHROMA TRAP
LPF
REC Y
REC C
PB Y
Q076-078 NOISE CANCEL CONTROL
(CN004 ⑥) STD
(CN004 ⑦) PRO
(CN002 ⑤) EDIT
Q066 DENSITY SWITCH
Q067-069 SHARPNESS CONTROL
Q055
Q056,057 PHASE COMP
Q058,059 AMP
NON-LINER DE-EMPHASIS HALF H SHIFT CANCEL
RV015 EXPANDER
V PG
RV016 PB LEVEL
Q065
D029 Y COMB DEFEAT
AFT
LIM
CL
DOC
13.3MHz (CF001)
AM MOD
1H DL DL003
RV017 Y COMB
LPF Q070
IC009 ㉖ PB
0.6Vp-p


VI-23 BOARD
AU-26 BOARD
MF-16 BOARD
IC001
IC006
IC007
IC008
IC009
IC001 ㊲ PB
IC001 ⑤,㉟ REC
IC001 ① REC
IC001 ㉟ PB
IC001 ⑲ REC/PB
IC001 ⑭ REC/PB
IC001 ㊴ REC
IC001 ㊴ PB
IC001 ㉘ PB(BF)
IC001 ㉝ REC/PB
IC001 ㉚ REC/PB
IC008 ㉜ PB
IC008 ㉟ PB
IC008 ㊳ PB
IC008 ③ REC
IC008 ⑥,㊲ REC
IC009 ㉖ PB
①,⑦ PB
2H DELAY DL001
4.43MHz BPF FL001
LV002 C COMB
RV001 C COMB
CHROMA REVERSE (B-ID)
F.F
ID DET
P.C
ACC DET
ACK DET
ACK
CH HOLD
ACC
LPF & TRAP
BPF
CONV 2
CONV 1
INV
CF002 5.12MHz
P1B ADD
PLL X3
APC DET
1/8
COUNTER
APC ID
VCO
VXO
AFC DET
HD Ge
CH-SW
RV002 C REC CURR
RV003 AFC OFFSET
RV002 AFC
RV004 CAR-BAL
RV021 P BURST LEVEL
CF001 13.3MHz
CV001 APC
X001 4.43MHz
DELAY
HALF H KILLER
PHASE SHIFT
RV005 PHASE SHIFT
RV020 EX CHROMA LEVEL
DL002 1H DELAY
SW
QUASI BURST
JUMP DET
SW CONT
BF
CF
PHASE INVERT
PHASE SHIFT
1H VCO
DET
HD
RV006 JOG PLL
B/W
COLOUR
LPF
SYNC SEP
GATE PULSE
AGC DET
MUTE
CLAMP
LIM
AGC
CHROMA TRAP
RV018 AGC
FM MOD
FM DET
DOC DET
RV023 DOC LEVEL
WHITE / DARK CLIP CARRIER SET, DEVIATION
NON-LINER PRE-EMPHASIS
HALF H SHIFT
RV009 DARK CLIP
RV010 WHITE CLIP
RV011 CARRIER SET
RV012 CARRIER SHIFT
RV013 DEVIATION
RV014 COMPRESS
DENSITY SWITCH
WHITE CLIP SHIFT
NOISE CANCEL CONTROL
SHARPNESS CONTROL
DENSITY SWITCH
PHASE COMP
AMP
NON-LINER DE-EMPHASIS HALF H SHIFT CANCEL
RV015 EXPANDER
RV016 PB LEVEL
Y COMB DEFEAT
AFT
Y COMB CONTROL
AM MOD
1H DL DL003
RV017 Y COMB
LPF Q070
CL
PB 9V SWITCH
6.5V REG
QUASI VD INSERTION
PB MUTE
RV001 SHARPNESS
S009 SUPER BETA
S005 INPUT SELECT
4.43MHz
COMP SYNC
RF SWP
(SERVO)
A' CONT (CN002 ⑥) SYSTEM CONTROL
C/R
MC
REC·PAUSE
V REC·P
V MUTE
(SYSTEM CONTROL)
VIDEO
MOD V OUT (TUNER)
VIDEO OUT
VIDEO IN
TU VIDEO (TUNER)
TU / LINE
SHARPNESS
NORM
STD
PRO
PB (SYSTEM CONTROL)
PB 9V
SWD 9V
6.5V
REC C
PB C
PB Y
REC Y
HD
V PG
RF SW P
ST-12
0.35Vp-p
0.3Vp-p
0.65Vp-p
0.7Vp-p
0.8Vp-p
1Vp-p
0.6Vp-p
1.2Vp-p
3.5Vp-p
1.1Vp-p
0.3Vp-p
4Vp-p
6Vp-p
0.55Vp-p
2.2Vp-p
2Vp-p
0.5Vp-p
13.3MHz
5.12MHz
4.43MHz

3-4. SYSTEM CONTROL BLOCK DIAGRAM


ST-12 BOARD(SYSTEM CONTROL)
MF-16 BOARD(1/2)
IC101
INF AMP
CN003
SIRCS
CN001
CNJ402
CONTROL S OUT
CNJ401
CONTROL S IN
Q405
Q406
Q409
BYPASS SWITCH
EVER 5V
SIRCS MUTE
IC404 (1/4)
SIRCS SWITCH
IC403
EDIT TRACKING CONTROL
SIRCS OUT
SIRCS ENBL
TRACON OUT
REC CTL
SUB DO
SUB DI
SIRCS ON
REC
RESET
EX
IC401
SYSTEM CONTROL
X OUT
CS
S CLOCK
S DATA TS
S DATA ST
TIMER
SERVO
TRACON CUT
REC PAUSE
ASS 2
CAP BRK
REVIEW
CAP STOP
DRUM STOP
ASS 1
JOG
REV+REW
FF+CUE
SLOW+STILL
PB+REC
DRUM FAST
CAP FWD
STEP PLS
8 FG
CTL
RF SW PULSE
DRUM SLOW
REC P
Q450
Q401
Q407
VI-23 BOARD
VIDEO
AUDIO
V MUTE
MC IN
MC OUT
EDIT ON
CUE+REV
C/R
PB
VD IN
VD OUT
A' HEAD
TO AUDIO
A MUTE
CN002
CN005
CN007
CN014
CN028
IC405 (1/2)
Q402
IC202
LOAD
UNLOAD
LOAD(+)
LOAD(−)
LOAD M(+)
LOAD M(−)
CN010
IC402
TAPE END SENSOR
TOP/END
END SENS
END/SENS
T SENS
S SENS
T.SENS
S.SENS
CN006
IC203
SOLENOID DRIVE
UNBRK ON
PINCH ON
BRK PL(S)
BRK PL(H)
PINCH PL(S)
PINCH PL(H)
CN008
CN007
ROT S
ROT T
ROT-S
ROT-T
CN011
TP401
RV401 FOWERD TORQUE
REEL STOP
REEL 1
REEL 2
REEL 3
IC201
DR-38 BOARD
Q223
REEL MOTOR DRIVE
Q221
MOTOR CURRENT DETECT
CC
CV
CV/CC
REEL FWD
REEL M(+)
REEL REV
CN004
F SW 1 EX
CN017
CN013
M SW
2 GANG
REC PRF
C-DN SW
C-ON SW
CN003
L-END SW
CN012
A' HEAD/L END
F SW 1
F SW 2
F SW 3
CN002
S101 REW
S102 EJECT
S103 GO TO ZERO
S104 FF
S105 PLAY
S109 STOP
S110 PAUSE /STILL
S111 FRAME
S401 STILL ADJ
VD ADJ
EX
X
CF401 6MHz
IC404 (1/4)
EDIT LED
CN701
D007 EDIT
3.8Vp-p
6MHz
IC401 (59) E-E


IC403
EDIT TRACKING CONTROL
SIRCS OUT
SIRCS ENBL
TRACON OUT
REC CTL
SUB DO
SUB DI
SIRCS ON
REC
RESET
EX
IC401
SYSTEM CONTROL
SUB DO
SUB DI
SIRCS ON
X OUT
CS
S CLOCK
S DATA TS
S DATA ST
RESET
Q450
Q401
Q407
REC P
ASS 2
CAP BRK
REVIEW
CAP STOP
DRUM STOP
ASS 1
JOG
REV+REW
FF+CUE
SLOW+STILL
PB+REC
DRUM FAST
CAP FWD
STEP PLS
B FG
CTL
RF SW PULSE
DRUM SLOW
REC P
V MUTE
MC
(1/2)
EDIT ON
CUE+REV
PB OUT
VD OUT
A MUTE
LOAD
UNLOAD
TOP/END
END SENS
UNBRK ON
PINCH ON
ROT S
ROT T
REEL STOP
REEL 1
REEL 2
REEL 3
CV/CC
REEL FWD
M SW
A' HEAD/L END
F SW 1
F SW 2
F SW 3
VD ADJ
EX
X
CF401
6MHz
S401
STILL ADJ
TP401
RV401
FOWERD TORQUE
IC202
LOAD
UNLOAD
LOAD(+)
LOAD(−)
IC402
TAPE END SENSOR
TOP/END
END/SENS
T SENS
S SENS
IC203
SOLENOID DRIVE
IC201
REEL STOP
DR-38 BOARD
Q223
REEL MOTOR DRIVE
Q221
MOTOR CURRENT DETECT
CC
CV
IC404 (1/4)
IC405 (1/2)
IC404 (1/4)
6MHz
3.8Vp-p
IC401 (59) E-E
CN010 LOAD M(+)
CN010 LOAD M(−)
M904
LOADING MOTOR
CN006 T.SENS
CN005 S.SENS
L902
T COIL SENSOR
L901
S COIL SENSOR
CN008 BRK PL(S)
CN008 BRK PL(H)
CN007 PINCH PL(S)
CN007 PINCH PL(H)
PM902
BRAKE SOLENOID
PM901
PINCH SOLENOID
CN011 ROT-S
CN011 ROT-T
MI-6 BOARD
PH002
S-REEL ROTATION DETECTOR
PH001
T-REEL ROTATION DETECTOR
MI-5 BOARD
CN004 REEL M(+)
REEL REV
M903
REEL MOTOR
CN017 F SW 1 EX
CN013 F SW 1 EX
2 GANG
CN008 REC PRF
CN008 C-DN SW
CN003 C-ON SW
CN012 L-END SW
S901(1/2)
REC PROOF
S901(1/2)
CASSETTE DOWN
S904
CASSETTE ON
S703
THREADING END
5V
CN013 F SW 1
CN013 F SW 2
CN013 F SW 3
CN017 EDIT LED
CN002
CN009
F SW 1 EX
SLOW(+)
SLOW(−)
S101 REW
S102 EJECT
S103 GO TO ZERO
S104 FF
S105 PLAY
S108 TRACKING +
S109 STOP
S110 PAUSE /STILL
S111 FRAME
S113 TRACKING −
MF-16 BOARD
CN701
CN702
S702 REC
S115 EDIT
S107 SLOW +
S112 SLOW −
D007 EDIT
MF-17 BOARD

3-5. SYSTEM CONTROL—VIDEO BLOCK INTERFACE

MODE			STOP	FF	REW	PB	PB·PAUSE (STILL)	BETA SCAN		REC	REC·PAUSE	SLOW 1/5-1/30	SKIP SCAN		EDIT PB
SIGNAL NAME	I/O	PIN No.						CUE	REVIEW				CUE	REVIEW	
$\overline{\text{REC·PAUSE}}$	O	IC401 ㉘	H	H	H	H	H	H	H	L	H	H	H	H	H
V MUTE	O	IC401 ⑱	L	L	L	L	L	L	L	L	L	L	L	L	L
$\overline{\text{REC·P(S)}}$	O	IC401 ⑳	H	H	H	H	H	H	H	L*1	H	H	H	H	H
MC OUT	O	IC401 ㉑	L	L	L	L	H	H	H	L	L	H	H	H	L
$\overline{\text{EDIT ON}}$	O	IC401 ㉔	H	H	H	H	H	H	H	H	H	H	H	H	L
$\overline{\text{CUE+REV}}$	O	IC401 ㉕	H	H	H	H	H	L	L	H	H	H	L	L	H
PB OUT	O	IC401 ㉖	L	L	L	H	H	H	H	L	L	H	H	H	H
VD OUT	O	IC401 (70)	L	L	L	L	*3	*3	*3	*3	L	*3	*3	*3	L
A' HEAD/L END	O/I	IC401 ⑧	L	L	L	L	H	L	L	L	L	H*2	L	L	L

*1. The $\overline{\text{REC·P(S)}}$ is 1.2msec later than $\overline{\text{REC·P}}$
*2. AT "L" pulse during the tepe running (STEP)
*3. Pulse of 50 Hz

3-6. SYSTEM CONTROL—MECHANISM BLOCK INTERFACE

MODE			EJECTED	LOADING	THREADING	STOP	UNTHREADING	UN-LOADING	FF	REW	PB	PB·PAUSE (STILL)	BETA SCAN		REC	REC-PAUSE	SLOW 1/5-1/30	SKIP SCAN	
SIGNAL NAME	I/O	PIN No.											CUE	REVIEW				CUE	REVIEW
LOAD	O	IC401 ①	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L
UNLOAD	O	IC401 ②	L	L	L	L	H	H	L	L	L	L	L	L	L	L	L	L	L
TOP/$\overline{\text{END}}$	O	IC401 ③	L	L	L	L	H	L	L	H	L	L	L	H	L	L	L	L	H
$\overline{\text{END SENS}}$*1	I	IC401 ⑤	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
$\overline{\text{UNBRK ON}}$	O	IC401 ④	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L
$\overline{\text{PINCH ON}}$	O	IC401 (80)	L	L	H	H	H	L	H	H	L	L	L	L	L	L	L	L	L
ROT S*2	I	IC401 ⑥																	
ROT T*3	I	IC401 ⑦																	
M SW*4	I	IC401 ⑬	5V	2V	0V(0.8V)	0V(0.8V)	0V(0.8V)	2V	0V(0.8V)	0V(0.8V)	0V(0.8V)	0V(0.8V)	0V(0.8V)	0V(0.8V)	0V	0V	0V(0.8V)	0V(0.8V)	0V(0.8V)
A'HEAD/L END	O/I	IC401 ⑧	L	L	L*5	L	L	L	L	L	L	H	L	L	L	L	H*6	L	L

*1. At "L" when performing the tape end/top or unthreading completion detection.
*2. The pulse input is proportional to the number of S reel rotations.
*3. The pulse input is proportional to the number of T reel rotations.
*4. In parentheses show the voltage when the erroneous recording prevention claw of the cassette is broken.
*5. At "H" when the threading is completed.
*6. At "L" pusle during the tape running (STEP).

3-7. SYSTEM CONTROL—REEL BLOCK INTERFACE

MODE			EJECTED	LOADING	THREADING
SIGNAL NAME	I/O	PIN No.			
$\overline{\text{REEL STOP}}$	O	IC401 (72)	L	L	H
REEL 1	O	IC401 (74)	L	L	L
REEL 2	O	IC401 (75)	L	L	H
REEL 3	O	IC401 (76)	H	H	H
CV/$\overline{\text{CC}}$	O	IC401 (78)	H	H	H
REEL FWD	O	IC401 (79)	H	H	H

*1. At "H" after one frame forwarding.

3-8. SYSTEM CONTROL—SYSTEM CONT

MODE		
SIGNAL NAME	I/O	PIN No.
F SW 1	I	IC401 ⑭
F SW 2	I	IC401 ⑮
F SW 3	I	IC401 ⑯
$\overline{\text{VD ADJ}}$	I	IC401 ⑰
SUB DO	O	IC401 (55)
SUB DI	O	IC401 (56)
$\overline{\text{SIRCS ON}}$	O	IC401 (57)
X OUT	O	IC401 (62)

SLOW 1/5-1/30	SKIP SCAN		EDIT PB
	CUE	REVIEW	
H	H	H	H
L	L	L	L
H	H	H	H
H	H	H	L
H	H	H	L
H	L	L	H
H	H	H	H
*3	*3	*3	L
H*2	L	L	L

PB	PB·PAUSE (STILL)	BETA SCAN		REC	REC-PAUSE	SLOW 1/5-1/30	SKIP SCAN	
		CUE	REVIEW				CUE	REVIEW
L	L	L	L	L	L	L	L	L
L	L	L	L	L	L	L	L	L
L	L	L	H	L	L	L	L	H
H	H	H	H	H	H	H	H	H
L	L	L	L	L	L	L	L	L
L	L	L	L	L	L	L	L	L
0.8V)	0V(0.8V)	0V(0.8V)	0V(0.8V)	0V	0V	0V(0.8V)	0V(0.8V)	0V(0.8V)
L	H	L	L	L	L	H*6	L	L

3-7. SYSTEM CONTROL—REEL BLOCK INTERFACE

MODE			EJECTED	LOADING	THREADING	STOP	UNTHREADING	UNLOADING	FF	REW	PB	PB·PAUSE (STILL)	BETA SCAN		REC	REC·PAUSE	SLOW 1/5-1/10	SKIP SCAN	
SIGNAL NAME	I/O	PIN No.											CUE	REVIEW				CUE	REVIEW
$\overline{\text{REEL STOP}}$	O	IC401 (72)	L	L	H	L	H	L	H	H	H	L*1	H	H	H	L	H	H	H
REEL 1	O	IC401 (74)	L	L	L	L	H	L	H	H	L	L	H	H	L	L	L	H	H
REEL 2	O	IC401 (75)	L	L	H	L	H	L	H	H	L	L	L	L	L	L	L	L	L
REEL 3	O	IC401 (76)	H	H	H	H	H	H	H	H	H	L	L	L	H	H	L	L	L
CV/$\overline{\text{CC}}$	O	IC401 (78)	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H
REEL FWD	O	IC401 (79)	H	H	H	H	L	H	H	L	H	H	H	L	H	H	H	H	L

*1. At "H" after one frame forwarding.

3-8. SYSTEM CONTROL—SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE

MODE			Input voltage value when button is pressed													
			REW	EJECT	GO TO ZERO	FF	PB	SLOW+	TRACKING +	STOP	PAUSE	FRAME	SLOW−	TRACKING −	REC	EDIT
			MF-16 board												MF-17 board	
SIGNAL NAME	I/O	PIN No.	S101	S102	S103	S104	S105	S107	S108	S109	S110	S111	S112	S113	S114	S115
F SW 1	I	IC401 ⑭	0V	1V	1.9V										2.9V	3.8V
F SW 2	I	IC401 ⑮				0V	1V	2.9V	3.8V							
F SW 3	I	IC401 ⑯								0V	1V	1.9V	2.9V	3.8V		
$\overline{\text{VD ADJ}}$	I	IC401 ⑰	It turns on when the dormant picture adjusting button is pressed.													
SUB DO	O	IC401 (55)	} Tracking control button data. { Only duringg the PB the staten of tracking+and−buttons are output.													
SUB DI	O	IC401 (56)														
$\overline{\text{SIRCS ON}}$	O	IC401 (57)	SIRCS trigger for the EDIT control (Normal...at "H", but at "L" pulse during the EDIT ⇄ PB·PAUSE mode transition period.)													
X OUT	O	IC401 (62)	Clock output for the tracking control microcomputer													

3-9. SYSTEM CONTROL—SERVO BLOCK INTERFACE

SIGNAL NAME	MODE		STOP	FF	REW	PB	PB·PAUSE (STILL)	BETA SCAN		REC	REC·PAUSE	SLOW 1/5-1/30	SKIP SCAN	
	I/O	PIN No.						CUE	REVIEW				CUE	REVIEW
TRACON OUT*1	O	IC403 ②												
REC CTL*2	I	IC403 ④												
REC·$\overline{\text{PAUSE}}$	O	IC401 ㉘	H	H	H	H	H	H	H	L	H	H	H	H
ASS 2	O	IC401 ㊱	L	H	H	L	H	H	H	H	H	H	H	H
$\overline{\text{CAP BRK}}$*3	O	IC401 ㊲	H	H	H	H	H	H	H	H	H	H	H	H
REVIEW	O	IC401 ㊴	L	L	L	L	L	L	H	L	L	L	L	H
$\overline{\text{CAP STOP}}$	O	IC401 ㊵	L	L	L	H	L	H	H	H	L	L	H	H
$\overline{\text{DRUM STOP}}$	O	IC401 ㊶	L	H	H	H	H	H	H	H	H	H	H	H
ASS 1	O	IC401 ㊹	L	L	L	L	L	L	L	L	L*4	L	L	L
JOG	O	IC401 ㊺	L	H	H	L	H	H	H	L	L	H	H	H
$\overline{\text{REV+REW}}$	O	IC401 ㊼	H	H	L	H	H	H	L	H	H	H	H	L
$\overline{\text{FF+CUE}}$	O	IC401 ㊽	H	L	H	H	H	L	H	H	H	H	L	H
$\overline{\text{SLOW+STILL}}$	O	IC401 ㊾	L	H	H	L	L	H	H	L	L	L	H	H
PB+REC	O	IC401 ㊿	H	L	L	H	L	L	L	H	H	L	L	L
$\overline{\text{DRUM FAST}}$	O	IC401 (51)	H	H	H	H	H*5	H	H	H	H	H*6	H	H
CAP FWD	O	IC401 (52)	H	H	H	H*7	H	H	L	H	H	H*8	H	L
STEP PLS	O	IC401 (53)	L	L	L	L*9	L*9	L	L	L	L	*10	L	L
8 FG*11	I	IC401 (66)												
CTL*12	I	IC401 (67)	(CTL)	CTL	CTL	CTL	(CTL)	CTL	CTL	REC-CTL	(CTL)	CTL	CTL	CTL
RF SW PULSE*19	I	IC401 (69)												
DRUM SLOW	O	IC401 (54)	L	L	L	L	L*14	L	L	L	L	L*15	L	L

- *1. Pulse of 25 Hz (_⎍_)
- *2. Duty 50% pulse of 25 Hz (⎺⊔⊓⎺)
- *3. At "L" when the capstan inverse rotation brake
  (During the transitional period of the CUE/REVIEW → PB, REC → REC·PAUSE, etc mode)
- *4. At "H" during period of the REC·PAUSE → REC mode.
- *5. The pulse of "L" during the transitional period of the PB·PAUSE → PB mode.
- *6. The pulse of "L" during tape speed acceleration.
- *7. The pulse of "L" during the transitional period of the PB → PB·PAUSE mode.
- *8. The pulse of "L" during tape speed deceleration.
- *9. The pulse of "H" during the transitional period of the ⇄ PB·PAUSE mode.
- *10. The pulse of "H" during the tape forwarding (during STEP).
- *11. Capstan FG signal input.
- *12. (CTL)...No pulse input as the tape does not move.
- *13. Duty 50% pulse of 25 Hz (⎺⊔⊓⎺)
- *14. The pulse "H" during the transitional period of the PB → STILL mode.
- *15. The pulse of "H" during tape steed deceleration.

3-10. SYSTEM CONTROL—AUDIO CIRCUIT INTERFACE

SIGNAL NAME	MODE		STOP	FF	REW	PB	PB·PAUSE (STILL)	BETA SCAN		REC
	I/O	PIN No.						CUE	REVIEW	
REC·$\overline{\text{PAUSE}}$	O	IC401 ㉘	H	H	H	H	H	H	H	L
MC OUT	O	IC401 ㉑	L	L	L	L	H	H	H	L
PB OUT	O	IC401 ㉖	L	L	L	H	H	H	H	L
$\overline{\text{A MUTE}}$	O	IC401 ㉙	H	H	H	H	L	L	L	H

3-11. SYSTEM CONTROL—TIMER BLOCK INTERFACE

SIGNAL NAME	MODE		FUNCTION
	I/O	PIN No.	
$\overline{\text{CS}}$	O	IC401 ㉜	Chip select signal
S DATA ST	O	IC401 (63)	Serial data (transmission)
S DATA TS	I	IC401 (64)	Serial data (receiving)
S CLOCK	O	IC401 (65)	Serial communication clock
$\overline{\text{RESET}}$	I	IC401 (61)	System control reset signal

SLOW 1/5-1/30	SKIP SCAN	
	CUE	REVIEW
H	H	H
H	H	H
H	H	H
L	L	H
L	H	H
H	H	H
L	L	L
H	H	H
H	H	L
H	L	H
L	H	H
L	L	L
H*6	H	H
H*8	H	L
*10	L	L
CTL	CTL	CTL
L*15	L	L

*1. Pulse of 25 Hz (_⎍_)
*2. Duty 50% pulse of 25 Hz (⎺⎽⎺⎽)
*3. At "L" when the capstan inverse rotation brake
(During the transitional period of the CUE/REVIEW → PB, REC → REC•PAUSE, etc mode)
*4. At "H" during period of the REC•PAUSE → REC mode.
*5. The pulse of "L" during the transitional period of the PB•PAUSE → PB mode.
*6. The pulse of "L" during tape speed acceleration.
*7. The pulse of "L" during the transitional period of the PB → PB•PAUSE mode.
*8. The pulse of "L" during tape speed deceleration.
*9. The pulse of "H" during the transitional period of the ⇄ PB•PAUSE mode.
*10. The pulse of "H" during the tape forwarding (during STEP).
*11. Capstan FG signal input.
*12. (CTL)...No pulse input as the tape does not move.
*13. Duty 50% pulse of 25 Hz (⎺⎽⎺⎽)
*14. The pulse "H" during the transitional period of the PB → STILL mode.
*15. The pulse of "H" during tape steed deceleration.

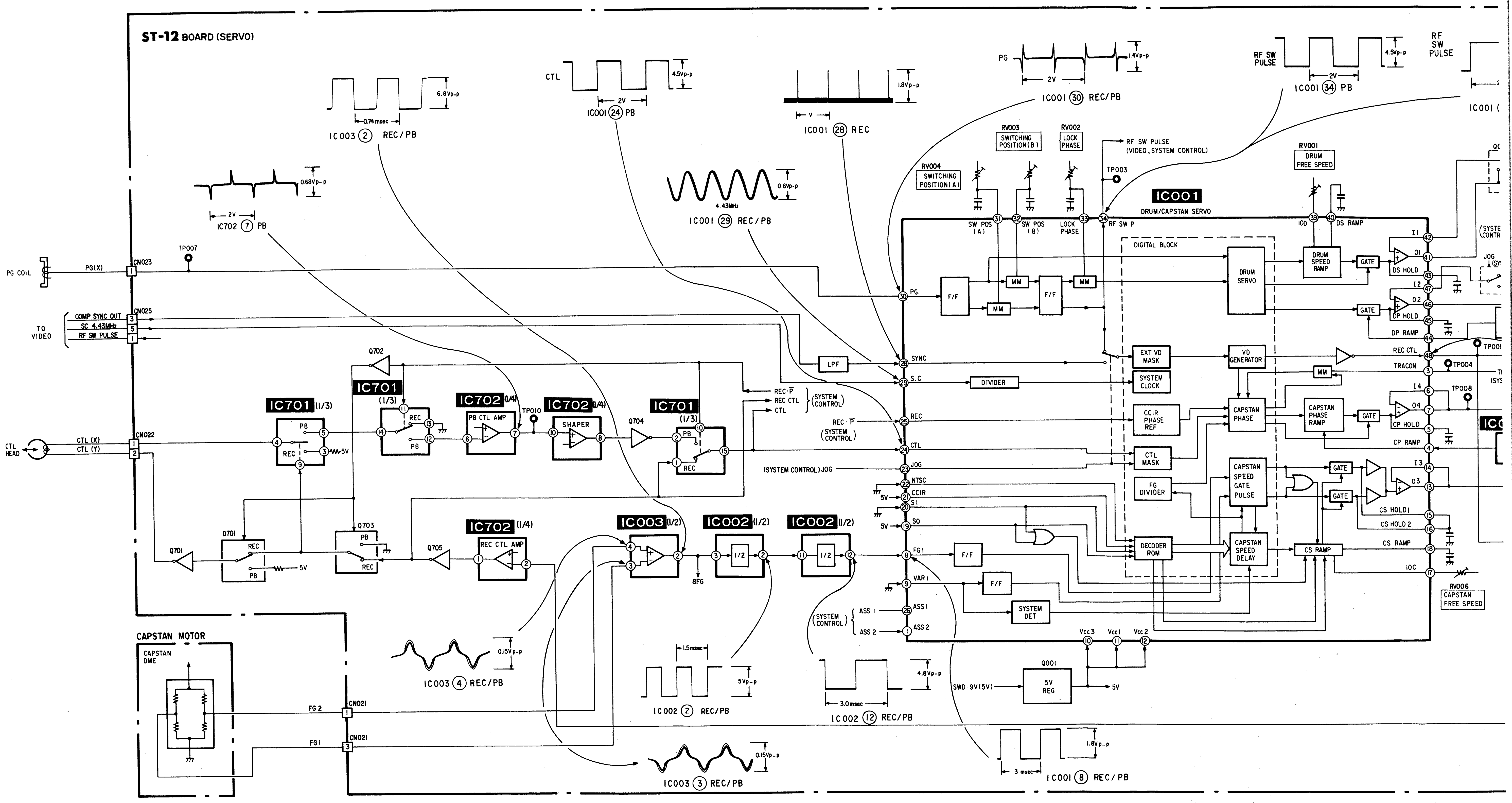
3-10. SYSTEM CONTROL—AUDIO CIRCUIT INTERFACE

	MODE		STOP	FF	REW	PB	PB• PAUSE (STILL)	BETA SCAN		REC	REC• PAUSE	SLOW 1/5-1/30	SKIP SCAN	
SIGNAL NAME	I/O	PIN No.						CUE	REVIEW				CUE	REVIEW
$\overline{\text{REC}}$•$\overline{\text{PAUSE}}$	O	IC401 ㉘	H	H	H	H	H	H	H	L	H	H	H	H
MC OUT	O	IC401 ㉑	L	L	L	L	H	H	H	L	L	H	H	H
PB OUT	O	IC401 ㉖	L	L	L	H	H	H	H	L	L	H	H	H
$\overline{\text{A MUTE}}$	O	IC401 ㉙	H	H	H	H	L	L	L	H	H	L	L	L

3-11. SYSTEM CONTROL—TIMER BLOCK INTERFACE

	MODE		FUNCTION
SIGNAL NAME	I/O	PIN No.	
$\overline{\text{CS}}$	O	IC401 ㉜	Chip select signal
S DATA ST	O	IC401 (63)	Serial data (transmission)
S DATA TS	I	IC401 (64)	Serial data (receiving)
S CLOCK	O	IC401 (65)	Serial communication clock
$\overline{\text{RESET}}$	I	IC401 (61)	System control reset signal

3-12. SERVO BLOCK DIAGRAM


ST-12 BOARD (SERVO)
PG COIL
PG(X)
CN023
TP007
TO VIDEO
COMP SYNC OUT
SC 4.43MHz
RF SW PULSE
CN025
CTL HEAD
CTL (X)
CTL (Y)
CN022
IC701 (1/3)
PB
REC
-5V
IC701
(1/3)
REC
PB
Q702
IC702 (1/4)
PB CTL AMP
TP010
IC702 (1/4)
SHAPER
Q704
IC701
(1/3)
PB
REC
REC·P̄
REC CTL
CTL
(SYSTEM CONTROL)
D701
REC
PB
5V
Q701
Q703
PB
REC
Q705
IC702 (1/4)
REC CTL AMP
IC003 (1/2)
IC002 (1/2)
IC002 (1/2)
1/2
1/2
8FG
CAPSTAN MOTOR
CAPSTAN DME
FG 2
FG 1
CN021
CN021
IC003 ② REC/PB
6.8Vp-p
0.74msec
CTL
4.5Vp-p
2V
IC001 ㉔ PB
1.8Vp-p
V
IC001 ㉘ REC
PG
1.4Vp-p
2V
IC001 ㉚ REC/PB
RF SW PULSE
4.5Vp-p
2V
IC001 ㉞ PB
RF SW PULSE
IC001 (
0.68Vp-p
2V
IC702 ⑦ PB
0.6Vp-p
4.43MHz
IC001 ㉙ REC/PB
0.15Vp-p
IC003 ④ REC/PB
1.5msec
5Vp-p
IC002 ② REC/PB
4.8Vp-p
3.0msec
IC002 ⑫ REC/PB
1.8Vp-p
3 msec
IC001 ⑧ REC/PB
0.15Vp-p
IC003 ③ REC/PB
RV004
SWITCHING POSITION(A)
RV003
SWITCHING POSITION(B)
RV002
LOCK PHASE
RF SW PULSE
(VIDEO, SYSTEM CONTROL)
TP003
RV001
DRUM FREE SPEED
IC001
DRUM/CAPSTAN SERVO
SW POS (A)
SW POS (B)
LOCK PHASE
RF SW P
DIGITAL BLOCK
IOD
DS RAMP
PG
F/F
MM
MM
F/F
MM
DRUM SERVO
DRUM SPEED RAMP
GATE
GATE
I1
O1
DS HOLD
I2
O2
DP HOLD
DP RAMP
JOG
SYNC
LPF
S.C
DIVIDER
REC
CTL
(SYSTEM CONTROL) JOG
REC·P̄
(SYSTEM CONTROL)
NTSC
CCIR
S1
SO
5V
5V
FG1
VAR1
ASS1
ASS 1
ASS 2
ASS 2
(SYSTEM CONTROL)
EXT VD MASK
SYSTEM CLOCK
CCIR PHASE REF
CTL MASK
FG DIVIDER
DECODER ROM
VD GENERATOR
CAPSTAN PHASE
CAPSTAN SPEED GATE PULSE
CAPSTAN SPEED DELAY
CS RAMP
CAPSTAN PHASE RAMP
MM
GATE
GATE
GATE
F/F
F/F
SYSTEM DET
REC CTL
TRACON
TP001
TP004
TP008
I4
O4
CP HOLD
CP RAMP
I3
O3
CS HOLD1
CS HOLD 2
CS RAMP
IOC
RV006
CAPSTAN FREE SPEED
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Vcc1
Vcc2
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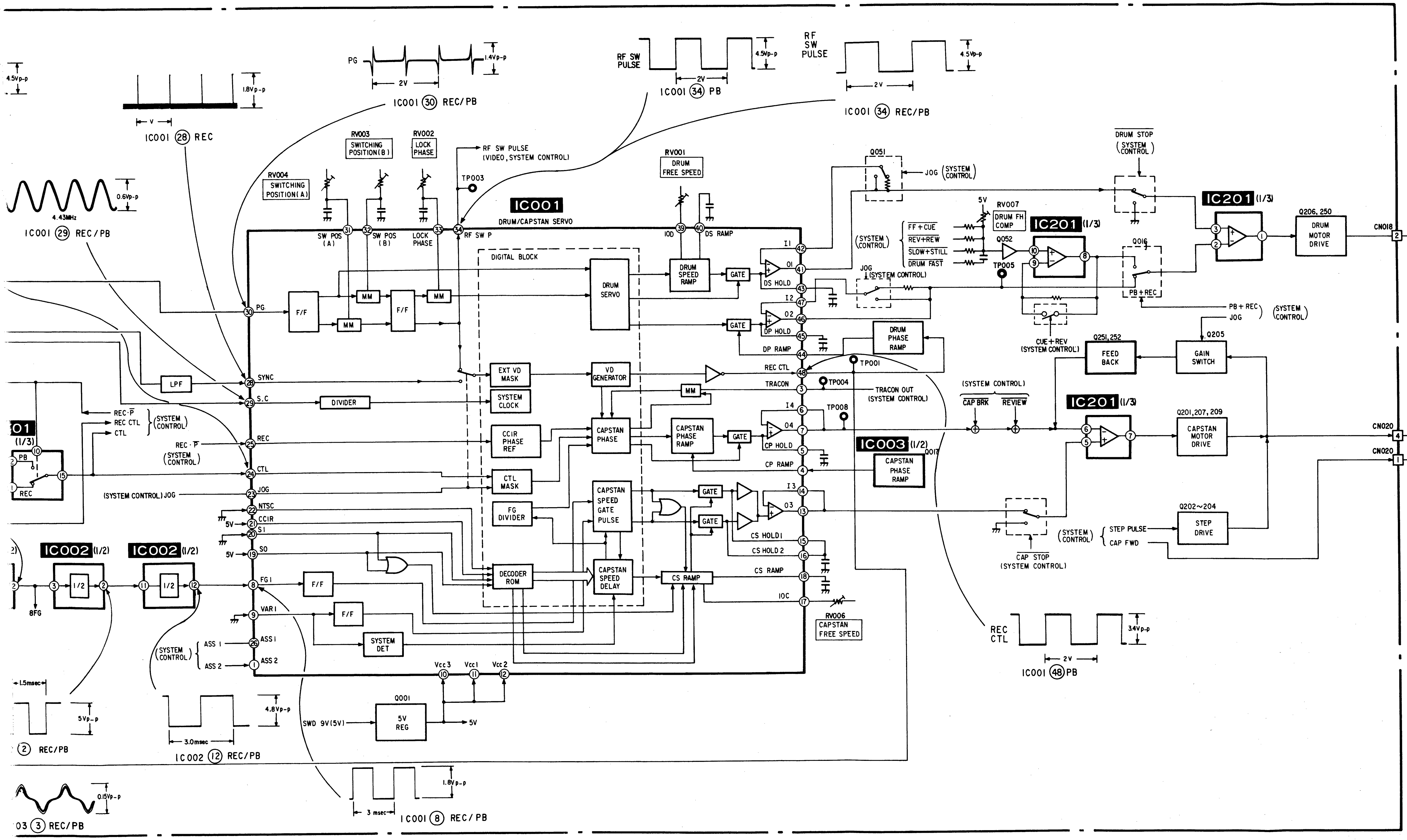
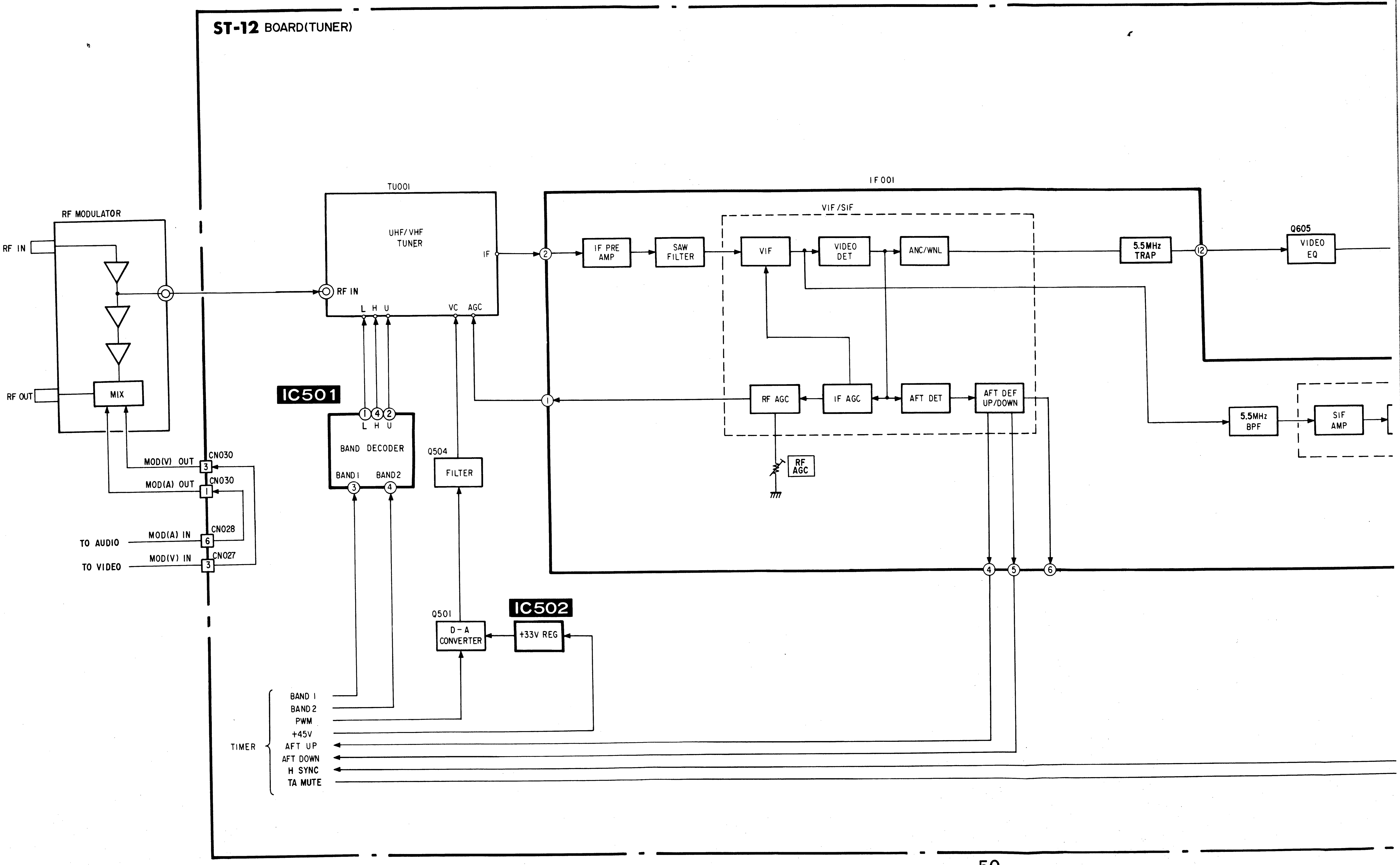
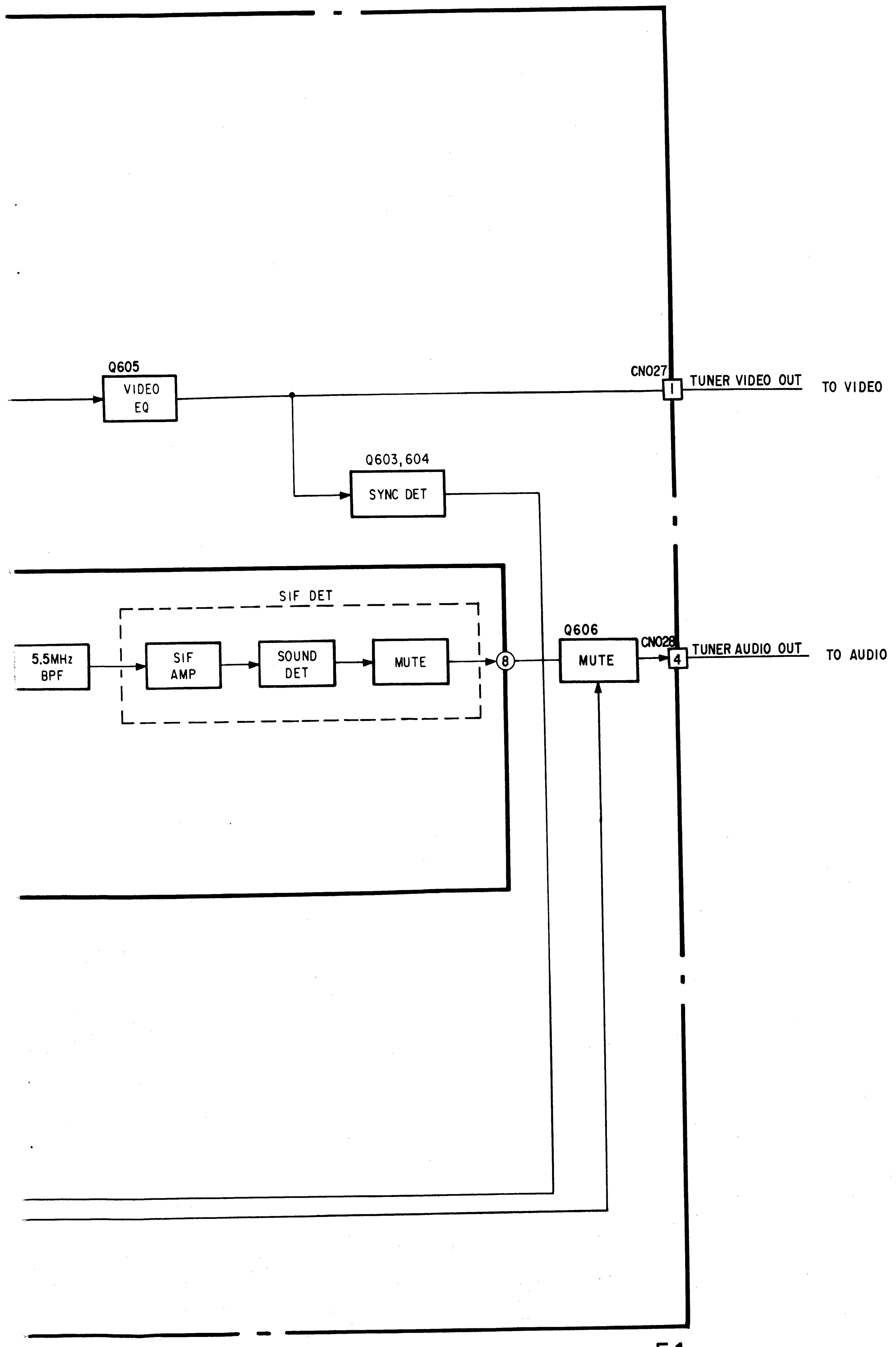
5V REG
SWD 9V(5V)
5V
5V

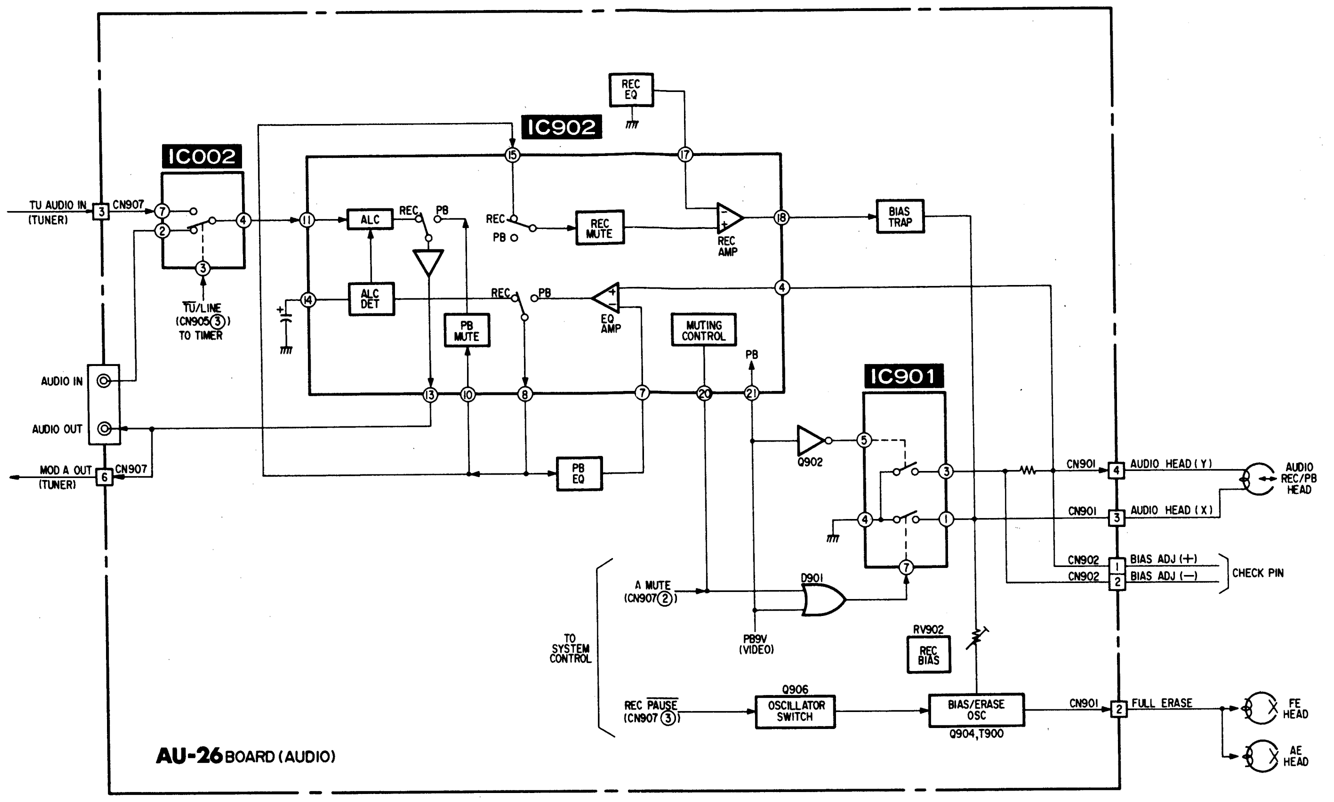

PG
1.4Vp-p
2V
IC001 30 REC/PB
1.8Vp-p
V
IC001 28 REC
4.5Vp-p
RF SW PULSE
4.5Vp-p
2V
IC001 34 PB
RF SW PULSE
4.5Vp-p
2V
IC001 34 REC/PB
0.6Vp-p
4.43MHz
IC001 29 REC/PB
RV004 SWITCHING POSITION(A)
RV003 SWITCHING POSITION(B)
RV002 LOCK PHASE
RF SW PULSE (VIDEO, SYSTEM CONTROL)
TP003
IC001
DRUM/CAPSTAN SERVO
RV001 DRUM FREE SPEED
SW POS (A)
SW POS (B)
LOCK PHASE
RF SW P
IOD
DS RAMP
DIGITAL BLOCK
DRUM SERVO
DRUM SPEED RAMP
GATE
DS HOLD
DP HOLD
DP RAMP
DRUM PHASE RAMP
PG
F/F
MM
SYNC
S.C
REC
CTL
JOG
NTSC
CCIR
S1
S0
FG1
VAR1
ASS1
ASS2
LPF
DIVIDER
EXT VD MASK
SYSTEM CLOCK
VD GENERATOR
CCIR PHASE REF
CAPSTAN PHASE
CAPSTAN PHASE RAMP
CTL MASK
FG DIVIDER
CAPSTAN SPEED GATE PULSE
DECODER ROM
CAPSTAN SPEED DELAY
CS RAMP
CS HOLD1
CS HOLD2
IOC
SYSTEM DET
REC CTL
TRACON
TP001
TP004
TRACON OUT (SYSTEM CONTROL)
TP008
CP HOLD
CP RAMP
IC003 (1/2)
Q017
CAPSTAN PHASE RAMP
RV006 CAPSTAN FREE SPEED
Vcc3 Vcc1 Vcc2
Q001
5V REG
SWD 9V(5V)
5V
REC·P̄
REC CTL
CTL
(SYSTEM CONTROL)
REC·P̄
(SYSTEM CONTROL)
(SYSTEM CONTROL) JOG
01 (1/3)
PB
REC
IC002 (1/2)
IC002 (1/2)
1/2
8FG
(SYSTEM CONTROL)
ASS 1
ASS 2
1.5msec
5Vp-p
2 REC/PB
4.8Vp-p
3.0msec
IC002 12 REC/PB
1.8Vp-p
3 msec
IC001 8 REC/PB
0.15Vp-p
03 3 REC/PB
Q051
JOG (SYSTEM CONTROL)
(SYSTEM CONTROL)
FF+CUE
REV+REW
SLOW+STILL
DRUM FAST
5V
RV007 DRUM FH COMP
Q052
IC201 (1/3)
TP005
JOG (SYSTEM CONTROL)
CUE+REV (SYSTEM CONTROL)
DRUM STOP (SYSTEM CONTROL)
Q016
PB+REC
PB+REC
JOG
(SYSTEM CONTROL)
IC201 (1/3)
Q206, 250
DRUM MOTOR DRIVE
CN018
DRUM ERROR
M901
DRUM MOTOR
Q205
GAIN SWITCH
Q251, 252
FEED BACK
(SYSTEM CONTROL)
CAP BRK
REVIEW
IC201 (1/3)
Q201, 207, 209
CAPSTAN MOTOR DRIVE
CN020
CAP ERROR
CN020
CAP REV
M902
CAPSTAN MOTOR
Q202~204
STEP DRIVE
(SYSTEM CONTROL)
STEP PULSE
CAP FWD
CAP STOP (SYSTEM CONTROL)
REC CTL
3.4Vp-p
2V
IC001 48 PB

3-13. TUNER BLOCK DIAGRAM


ST-12 BOARD(TUNER)
RF MODULATOR
RF IN
RF OUT
MIX
MOD(V) OUT
MOD(A) OUT
CN030
CN030
TO AUDIO
MOD(A) IN
CN028
TO VIDEO
MOD(V) IN
CN027
TU001
UHF/VHF TUNER
IF
RF IN
L H U
VC AGC
IC501
BAND DECODER
BAND1 BAND2
Q504
FILTER
Q501
D-A CONVERTER
IC502
+33V REG
IF001
VIF/SIF
IF PRE AMP
SAW FILTER
VIF
VIDEO DET
ANC/WNL
RF AGC
IF AGC
AFT DET
AFT DEF UP/DOWN
RF AGC
5.5MHz TRAP
Q605
VIDEO EQ
5.5MHz BPF
SIF AMP
TIMER
BAND 1
BAND 2
PWM
+45V
AFT UP
AFT DOWN
H SYNC
TA MUTE


Q605
VIDEO EQ
CN027
1
TUNER VIDEO OUT
TO VIDEO
Q603,604
SYNC DET
SIF DET
5.5MHz BPF
SIF AMP
SOUND DET
MUTE
8
Q606
MUTE
CN028
4
TUNER AUDIO OUT
TO AUDIO

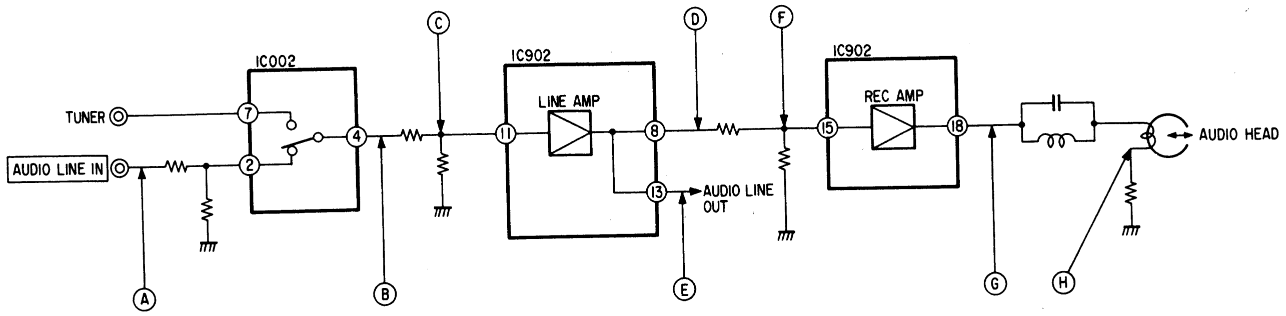
3-14. AUDIO BLOCK DIAGRAM


TU AUDIO IN (TUNER)
CN907
3
IC002
7
2
4
3
TU/LINE (CN905③) TO TIMER
AUDIO IN
AUDIO OUT
MOD A OUT (TUNER)
CN907
6
IC902
REC EQ
15
17
11
ALC
REC
PB
REC
PB
REC MUTE
REC AMP
18
BIAS TRAP
14
ALC DET
REC
PB
EQ AMP
4
PB MUTE
MUTING CONTROL
PB
13
10
8
7
20
21
PB EQ
IC901
5
Q902
3
4
1
7
CN901
4
AUDIO HEAD (Y)
AUDIO REC/PB HEAD
CN901
3
AUDIO HEAD (X)
CN902
1
BIAS ADJ (+)
CN902
2
BIAS ADJ (—)
CHECK PIN
A MUTE (CN907②)
D901
TO SYSTEM CONTROL
PB9V (VIDEO)
RV902
REC BIAS
REC PAUSE (CN907③)
Q906
OSCILLATOR SWITCH
BIAS/ERASE OSC
Q904,T900
CN901
2
FULL ERASE
FE HEAD
AE HEAD
AU-26 BOARD (AUDIO)

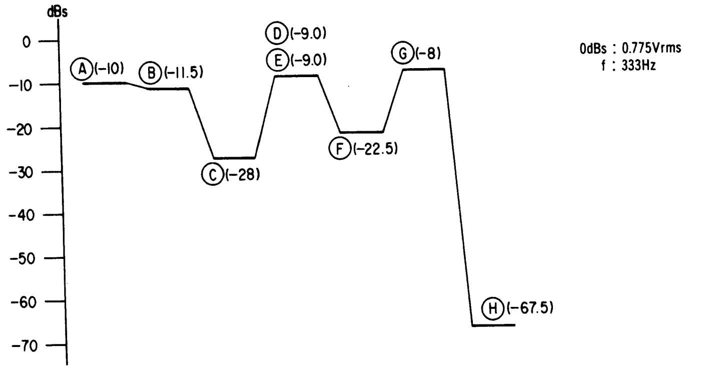
3-15. AUDIO LEVEL DIAGRAM

—Recording system—

AU-26 BOARD

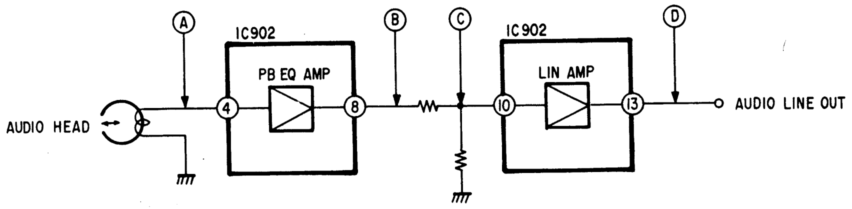


IC002
TUNER
AUDIO LINE IN
IC902
LINE AMP
AUDIO LINE OUT
REC AMP
AUDIO HEAD
A
B
C
D
E
F
G
H

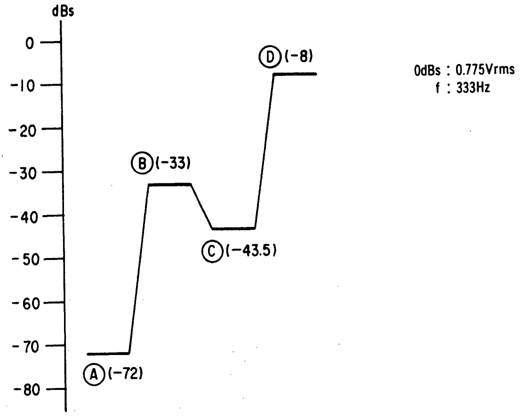


—Playback system—

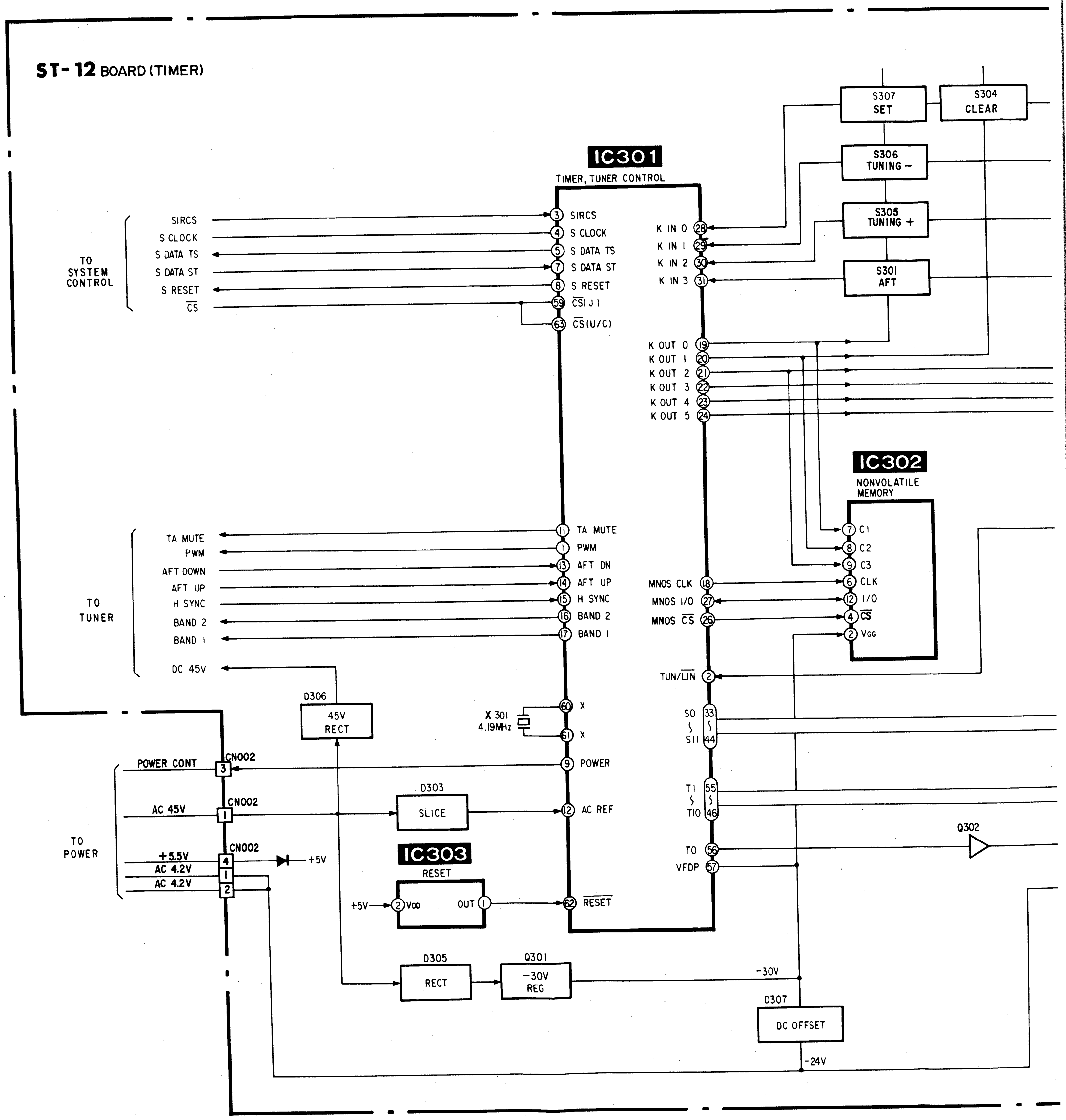
AU-26 BOARD



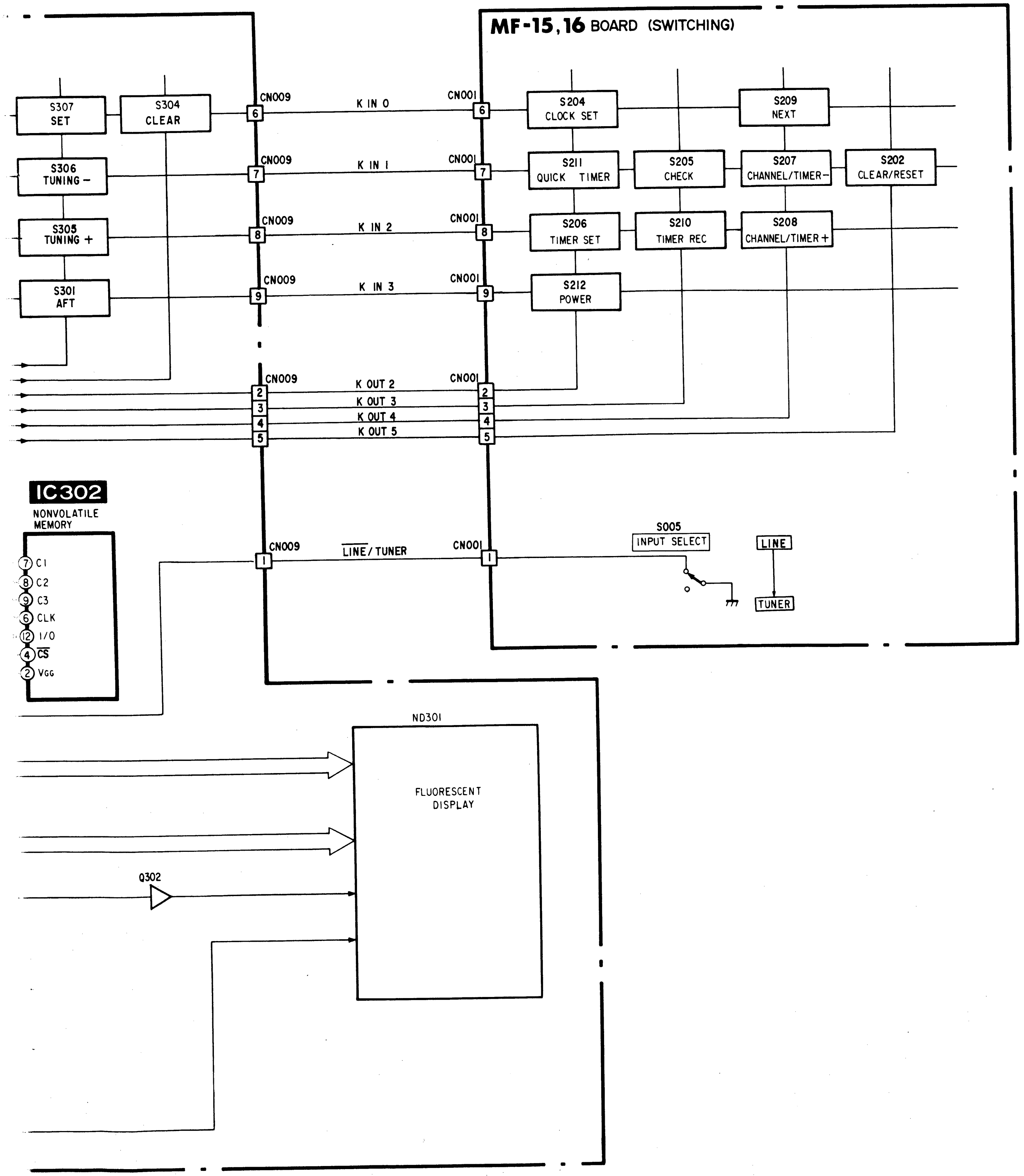
AUDIO HEAD
IC902
PB EQ AMP
LIN AMP
AUDIO LINE OUT
A
B
C
D



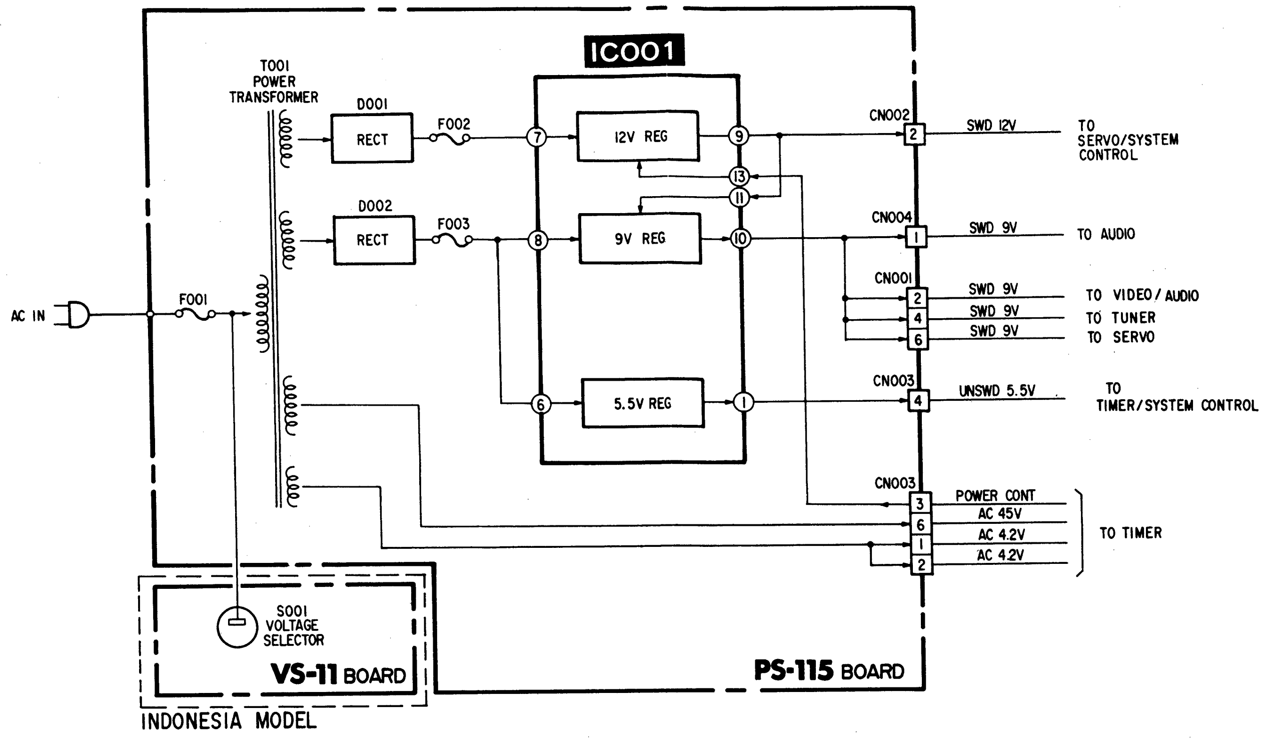
3-16. TIMER BLOCK DIAGRAM



ST-12 BOARD (TIMER)
IC301
TIMER, TUNER CONTROL
TO SYSTEM CONTROL
SIRCS
S CLOCK
S DATA TS
S DATA ST
S RESET
CS
CS(J)
CS(U/C)
S307 SET
S304 CLEAR
S306 TUNING −
S305 TUNING +
S301 AFT
K IN 0
K IN 1
K IN 2
K IN 3
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4
K OUT 5
IC302
NONVOLATILE MEMORY
C1
C2
C3
CLK
I/O
CS
VGG
MNOS CLK
MNOS I/O
MNOS CS
TO TUNER
TA MUTE
PWM
AFT DOWN
AFT UP
H SYNC
BAND 2
BAND 1
DC 45V
AFT DN
TUN/LIN
SO
S11
T1
T10
TO
VFDP
D306
45V RECT
X301
4.19MHz
X
POWER
AC REF
RESET
TO POWER
POWER CONT
AC 45V
+5.5V
AC 4.2V
AC 4.2V
CN002
+5V
D303
SLICE
IC303
RESET
+5V
VDD
OUT
D305
RECT
Q301
−30V REG
−30V
D307
DC OFFSET
−24V
Q302

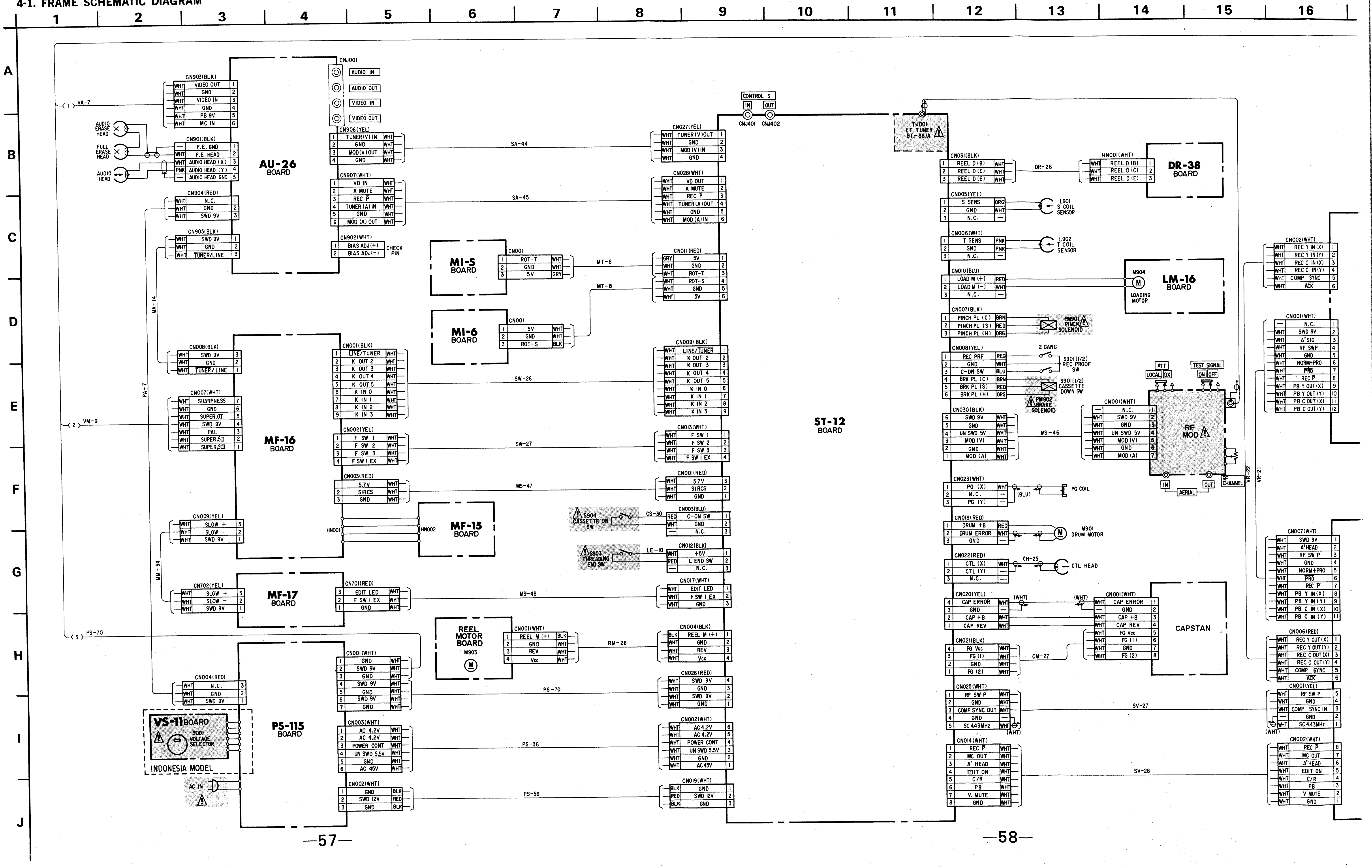

MF-15,16 BOARD (SWITCHING)
S307 SET
S304 CLEAR
S306 TUNING −
S305 TUNING +
S301 AFT
CN009
CN001
K IN 0
K IN 1
K IN 2
K IN 3
K OUT 2
K OUT 3
K OUT 4
K OUT 5
S204 CLOCK SET
S209 NEXT
S211 QUICK TIMER
S205 CHECK
S207 CHANNEL/TIMER−
S202 CLEAR/RESET
S206 TIMER SET
S210 TIMER REC
S208 CHANNEL/TIMER+
S212 POWER
IC302
NONVOLATILE MEMORY
7 C1
8 C2
9 C3
6 CLK
12 I/O
4 CS
2 VGG
LINE/TUNER
S005 INPUT SELECT
LINE
TUNER
ND301
FLUORESCENT DISPLAY
Q302

3-17. POWER BLOCK DIAGRAM


IC001
T001 POWER TRANSFORMER
D001 RECT
D002 RECT
F001
F002
F003
AC IN
12V REG
9V REG
5.5V REG
CN002
CN004
CN001
CN003
SWD 12V
TO SERVO/SYSTEM CONTROL
SWD 9V
TO AUDIO
SWD 9V
TO VIDEO/AUDIO
SWD 9V
TO TUNER
SWD 9V
TO SERVO
UNSWD 5.5V
TO TIMER/SYSTEM CONTROL
POWER CONT
AC 45V
AC 4.2V
AC 4.2V
TO TIMER
S001 VOLTAGE SELECTOR
VS-11 BOARD
INDONESIA MODEL
PS-115 BOARD

SECTION 4
SCHEMATIC DIAGRAM AND PRINTED WIRING BOARDS

4-1. FRAME SCHEMATIC DIAGRAM


1
2
3
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5
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7
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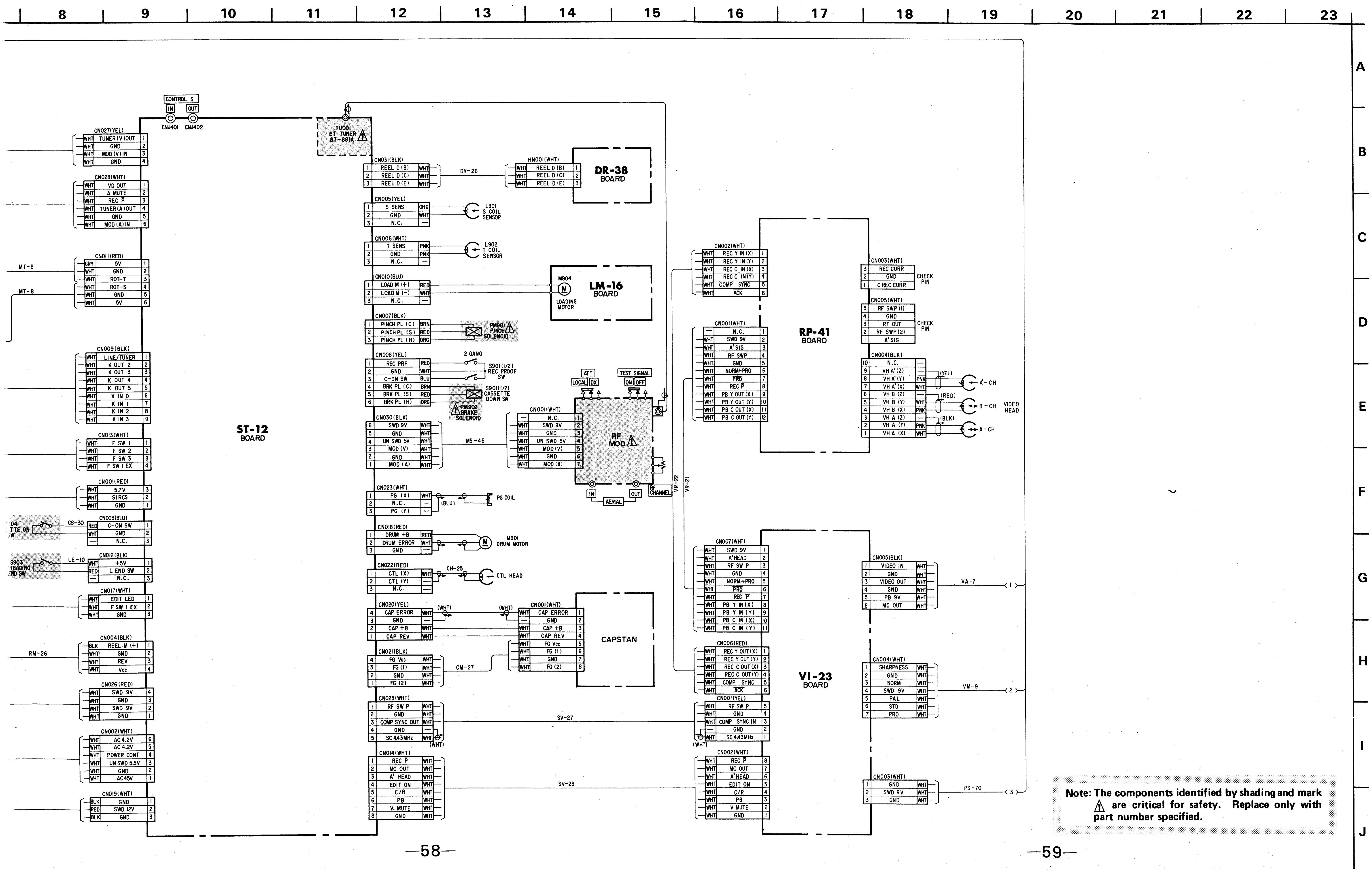
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
AU-26 BOARD
CN903(BLK) VIDEO OUT, GND, VIDEO IN, GND, PB 9V, MC IN
CN901(BLK) F.E. GND, F.E. HEAD, AUDIO HEAD (X), AUDIO HEAD (Y), AUDIO HEAD GND
AUDIO ERASE HEAD
FULL ERASE HEAD
AUDIO HEAD
CN904(RED) N.C., GND, SWD 9V
CN905(BLK) SWD 9V, GND, TUNER/LINE
CNJ001 AUDIO IN, AUDIO OUT, VIDEO IN, VIDEO OUT
CN906(YEL) TUNER(V) IN, GND, MOD(V) OUT, GND
CN907(WHT) VD IN, A MUTE, REC P, TUNER (A) IN, GND, MOD (A) OUT
CN902(WHT) BIAS ADJ(+), BIAS ADJ(−)
CHECK PIN
VA-7
VM-9
PS-70
MA-14
PA-7
MM-34
SA-44
SA-45
MT-8
SW-26
SW-27
MS-47
MS-48
CS-30
LE-10
RM-26
PS-36
PS-56
MI-5 BOARD
CN001 ROT-T, GND, 5V
MI-6 BOARD
CN001 5V, GND, ROT-S
MF-16 BOARD
CN008(BLK) SWD 9V, GND, TUNER/LINE
CN007(WHT) SHARPNESS, GND, SUPER βI, SWD 9V, PAL, SUPER βII, SUPER βIII
CN009(YEL) SLOW +, SLOW −, SWD 9V
CN001(BLK) LINE/TUNER, K OUT 2, K OUT 3, K OUT 4, K OUT 5, K IN 0, K IN 1, K IN 2, K IN 3
CN002(YEL) F SW 1, F SW 2, F SW 3, F SW 1 EX
CN003(RED) 5.7V, SIRCS, GND
HN001
HN002
MF-15 BOARD
MF-17 BOARD
CN702(YEL) SLOW +, SLOW −, SWD 9V
CN701(RED) EDIT LED, F SW 1 EX, GND
REEL MOTOR BOARD
M903
CN001(WHT) REEL M (+), GND, REV, Vcc
PS-115 BOARD
CN004(RED) N.C., GND, SWD 9V
CN001(WHT) GND, SWD 9V, GND, SWD 9V, GND, SWD 9V, GND
CN003(WHT) AC 4.2V, AC 4.2V, POWER CONT, UN SWD 5.5V, GND, AC 45V
CN002(WHT) GND, SWD 12V, GND
VS-11 BOARD
S001 VOLTAGE SELECTOR
INDONESIA MODEL
AC IN
ST-12 BOARD
CONTROL S IN OUT
CNJ401
CNJ402
CN027(YEL) TUNER (V) OUT, GND, MOD (V) IN, GND
CN028(WHT) VD OUT, A MUTE, REC P, TUNER (A) OUT, GND, MOD (A) IN
CN011(RED) 5V, GND, ROT-T, ROT-S, GND, 5V
CN009(BLK) LINE/TUNER, K OUT 2, K OUT 3, K OUT 4, K OUT 5, K IN 0, K IN 1, K IN 2, K IN 3
CN013(WHT) F SW 1, F SW 2, F SW 3, F SW 1 EX
CN001(RED) 5.7V, SIRCS, GND
CN003(BLU) C-ON SW, GND, N.C.
S904 CASSETTE ON SW
CN012(BLK) +5V, L END SW, N.C.
S903 THREADING END SW
CN017(WHT) EDIT LED, F SW 1 EX, GND
CN004(BLK) REEL M (+), GND, REV, Vcc
CN026(RED) SWD 9V, GND, SWD 9V, GND
CN002(WHT) AC 4.2V, AC 4.2V, POWER CONT, UN SWD 5.5V, GND, AC 45V
CN019(WHT) GND, SWD 12V, GND
TU001 ET TUNER BT-881A
CN031(BLK) REEL D (B), REEL D (C), REEL D (E)
DR-26
HN001(WHT) REEL D (B), REEL D (C), REEL D (E)
DR-38 BOARD
CN005(YEL) S SENS, GND, N.C.
L901 S COIL SENSOR
CN006(WHT) T SENS, GND, N.C.
L902 T COIL SENSOR
CN010(BLU) LOAD M (+), LOAD M (−), N.C.
M904 LOADING MOTOR
LM-16 BOARD
CN007(BLK) PINCH PL (C), PINCH PL (S), PINCH PL (H)
PM901 PINCH SOLENOID
CN008(YEL) REC PRF, GND, C-ON SW, BRK PL (C), BRK PL (S), BRK PL (H)
2 GANG
S901(1/2) REC PROOF SW
S901(1/2) CASSETTE DOWN SW
PM902 BRAKE SOLENOID
ATT LOCAL DX
TEST SIGNAL ON OFF
CN030(BLK) SWD 9V, GND, UN SWD 5V, MOD (V), GND, MOD (A)
MS-46
CN001(WHT) N.C., SWD 9V, GND, UN SWD 5V, MOD (V), GND, MOD (A)
RF MOD
IN OUT AERIAL
RF CHANNEL
CN023(WHT) PG (X), N.C., PG (Y)
PG COIL
CN018(RED) DRUM +B, DRUM ERROR, GND
M901 DRUM MOTOR
CN022(RED) CTL (X), CTL (Y), N.C.
CH-25
CTL HEAD
CN020(YEL) CAP ERROR, GND, CAP +B, CAP REV
CN001(WHT) CAP ERROR, GND, CAP +B, CAP REV, FG Vcc, FG (1), GND, FG (2)
CAPSTAN
CN021(BLK) FG Vcc, FG (1), GND, FG (2)
CM-27
CN025(WHT) RF SW P, GND, COMP SYNC OUT, GND, SC 4.43MHz
SV-27
CN014(WHT) REC P, MC OUT, A' HEAD, EDIT ON, C/R, PB, V. MUTE, GND
SV-28
VR-22
VR-21
CN002(WHT) REC Y IN (X), REC Y IN (Y), REC C IN (X), REC C IN (Y), COMP SYNC, ACK
CN001(WHT) N.C., SWD 9V, A'SIG, RF SWP, GND, NORM+PRO, PRO, REC P, PB Y OUT (X), PB Y OUT (Y), PB C OUT (X), PB C OUT (Y)
CN007(WHT) SWD 9V, A'HEAD, RF SW P, GND, NORM+PRO, PRO, REC P, PB Y IN (X), PB Y IN (Y), PB C IN (X), PB C IN (Y)
CN006(RED) REC Y OUT (X), REC Y OUT (Y), REC C OUT (X), REC C OUT (Y), COMP SYNC, ACK
CN001(YEL) RF SW P, GND, COMP SYNC IN, GND, SC 4.43MHz
CN002(WHT) REC P, MC OUT, A'HEAD, EDIT ON, C/R, PB, V MUTE, GND
WHT
RED
BLK
GRY
YEL
BLU
ORG
BRN
PNK


8
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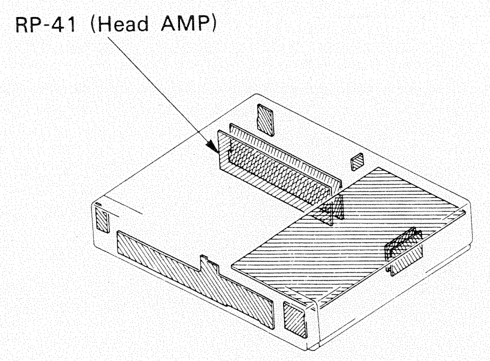
22
23
A
B
C
D
E
F
G
H
I
J
CONTROL S
IN
OUT
CNJ401
CNJ402
TU001
ET TUNER
BT-881A
ST-12
BOARD
CN027(YEL)
TUNER(V)OUT
GND
MOD(V)IN
GND
CN028(WHT)
VD OUT
A MUTE
REC P
TUNER(A)OUT
GND
MOD(A)IN
CN011(RED)
MT-8
5V
GND
ROT-T
ROT-S
GND
5V
CN009(BLK)
LINE/TUNER
K OUT 2
K OUT 3
K OUT 4
K OUT 5
K IN 0
K IN 1
K IN 2
K IN 3
CN013(WHT)
F SW 1
F SW 2
F SW 3
F SW 1 EX
CN001(RED)
5.7V
SIRCS
GND
CN003(BLU)
CS-30
C-ON SW
GND
N.C.
TTE ON
CN012(BLK)
LE-10
S903
READING
ND SW
+5V
L END SW
N.C.
CN017(WHT)
EDIT LED
F SW 1 EX
GND
CN004(BLK)
RM-26
REEL M (+)
GND
REV
Vcc
CN026(RED)
SWD 9V
GND
SWD 9V
GND
CN002(WHT)
AC 4.2V
AC 4.2V
POWER CONT
UN SWD 5.5V
GND
AC45V
CN019(WHT)
GND
SWD 12V
GND
CN031(BLK)
REEL D (B)
REEL D (C)
REEL D (E)
DR-26
HN001(WHT)
DR-38
BOARD
CN005(YEL)
S SENS
GND
N.C.
L901
S COIL
SENSOR
CN006(WHT)
T SENS
GND
N.C.
L902
T COIL
SENSOR
CN010(BLU)
LOAD M (+)
LOAD M (−)
N.C.
M904
LOADING
MOTOR
LM-16
BOARD
CN007(BLK)
PINCH PL (C)
PINCH PL (S)
PINCH PL (H)
PM901
PINCH
SOLENOID
CN008(YEL)
REC PRF
GND
C-DN SW
BRK PL (C)
BRK PL (S)
BRK PL (H)
2 GANG
S901(1/2)
REC PROOF
SW
S901(1/2)
CASSETTE
DOWN SW
PM902
BRAKE
SOLENOID
CN030(BLK)
SWD 9V
GND
UN SWD 5V
MOD (V)
GND
MOD (A)
MS-46
CN001(WHT)
N.C.
SWD 9V
GND
UN SWD 5V
MOD (V)
GND
MOD (A)
ATT
LOCAL
DX
TEST SIGNAL
ON
OFF
RF
MOD
IN
OUT
AERIAL
RF
CHANNEL
VR-22
VR-21
CN023(WHT)
PG (X)
N.C.
PG (Y)
(BLU)
PG COIL
CN018(RED)
DRUM +B
DRUM ERROR
GND
M901
DRUM MOTOR
CN022(RED)
CH-25
CTL (X)
CTL (Y)
N.C.
CTL HEAD
CN020(YEL)
CAP ERROR
GND
CAP +B
CAP REV
(WHT)
CN001(WHT)
CAP ERROR
GND
CAP +B
CAP REV
FG Vcc
FG (1)
GND
FG (2)
CAPSTAN
CN021(BLK)
FG Vcc
FG (1)
GND
FG (2)
CM-27
CN025(WHT)
RF SW P
GND
COMP SYNC OUT
GND
SC 4.43MHz
SV-27
CN014(WHT)
REC P
MC OUT
A' HEAD
EDIT ON
C/R
PB
V. MUTE
GND
SV-28
CN002(WHT)
REC Y IN (X)
REC Y IN (Y)
REC C IN (X)
REC C IN (Y)
COMP SYNC
ACK
CN001(WHT)
N.C.
SWD 9V
A' SIG
RF SWP
GND
NORM+PRO
PRO
REC P
PB Y OUT (X)
PB Y OUT (Y)
PB C OUT (X)
PB C OUT (Y)
RP-41
BOARD
CN003(WHT)
REC CURR
GND
C REC CURR
CHECK
PIN
CN005(WHT)
RF SWP (1)
GND
RF OUT
RF SWP (2)
A' SIG
CN004(BLK)
N.C.
VH A' (Z)
VH A' (Y)
VH A' (X)
VH B (Z)
VH B (Y)
VH B (X)
VH A (Z)
VH A (Y)
VH A (X)
(YEL)
(RED)
(BLK)
A'-CH
B-CH
A-CH
VIDEO
HEAD
CN007(WHT)
SWD 9V
A' HEAD
RF SW P
GND
NORM+PRO
PRO
REC P
PB Y IN (X)
PB Y IN (Y)
PB C IN (X)
PB C IN (Y)
CN006(RED)
REC Y OUT (X)
REC Y OUT (Y)
REC C OUT (X)
REC C OUT (Y)
COMP SYNC
ACK
CN001(YEL)
RF SW P
GND
COMP SYNC IN
GND
SC 4.43MHz
CN002(WHT)
REC P
MC OUT
A' HEAD
EDIT ON
C/R
PB
V MUTE
GND
VI-23
BOARD
CN005(BLK)
VIDEO IN
GND
VIDEO OUT
GND
PB 9V
MC OUT
VA-7
CN004(WHT)
SHARPNESS
GND
NORM
SWD 9V
PAL
STD
PRO
VM-9
CN003(WHT)
GND
SWD 9V
GND
PS-70
WHT
BLK
RED
YEL
GRY
ORG
PNK
BRN
BLU

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

Note:

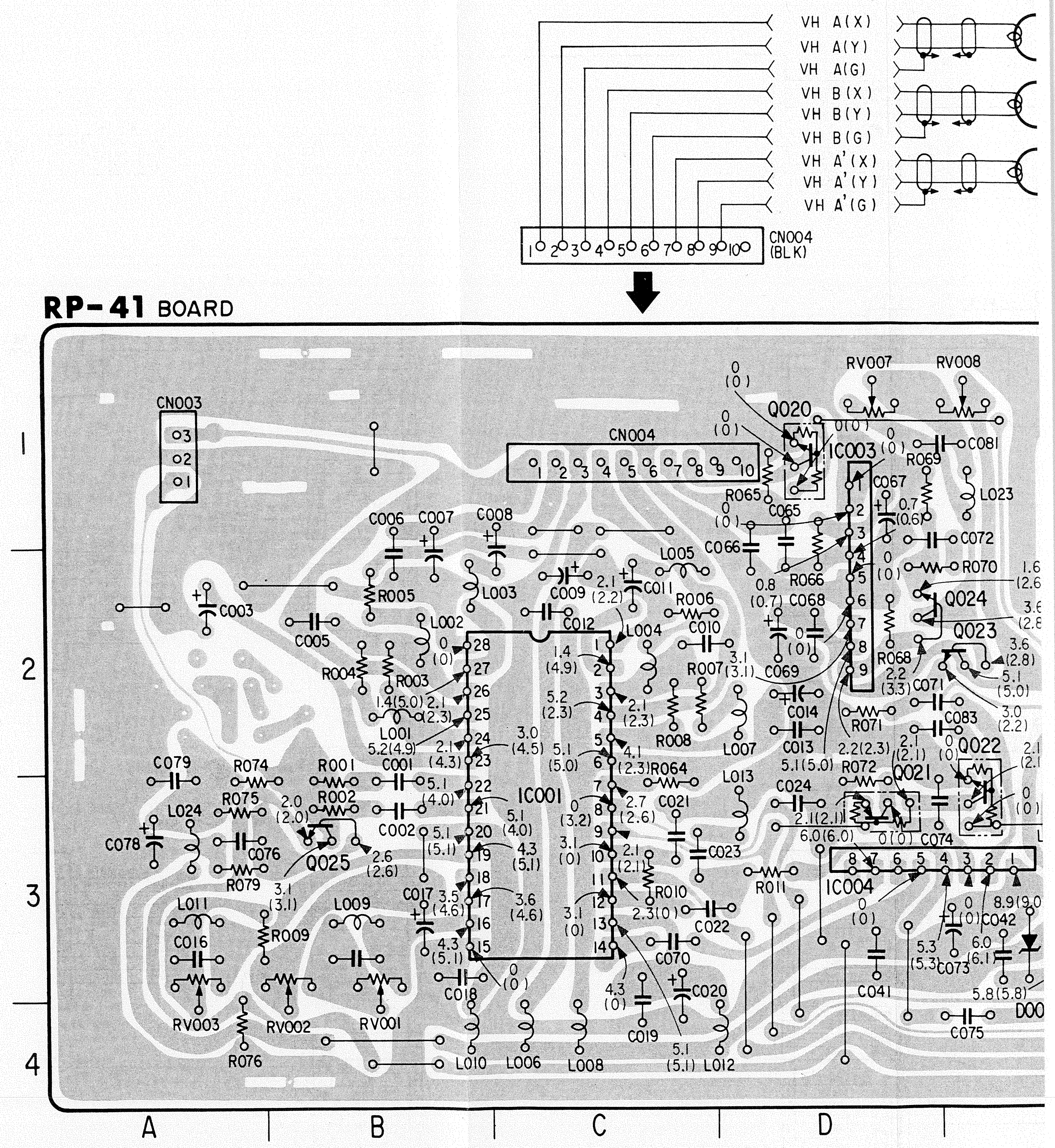
- ○— : indicates a lead wire mounted on the component side.
- ▨ : soldering side.
- ▨ : B+ Pattern.


RP-41 (Head AMP)

RP-41(HEAD AMP) PRINTED WIRING BOARD

—Ref. No. RP-41 BOARD : 2,000 series—

D001	F-2
D002	F-2
D003	E-3
D004	H-3
D005	H-3
D006	G-2
IC001	C-3
IC002	F-3
IC003	D-2
IC004	D-3
Q001	F-3
Q002	F-2
Q003	E-3
Q004	H-2
Q005	H-2
Q006	H-2
Q007	H-1
Q008	H-3
Q010	G-3
Q011	H-3
Q012	H-3
Q013	G-1
Q014	G-1
Q015	G-2
Q016	G-2
Q017	G-2
Q018	G-2
Q019	G-2
Q020	D-1
Q021	D-3
Q022	E-3
Q023	E-2
Q024	D-2
Q025	B-3
RV001	A-3
RV002	B-3
RV003	B-3
RV004	H-4
RV005	H-4
RV006	G-1
RV007	D-1
RV008	E-1

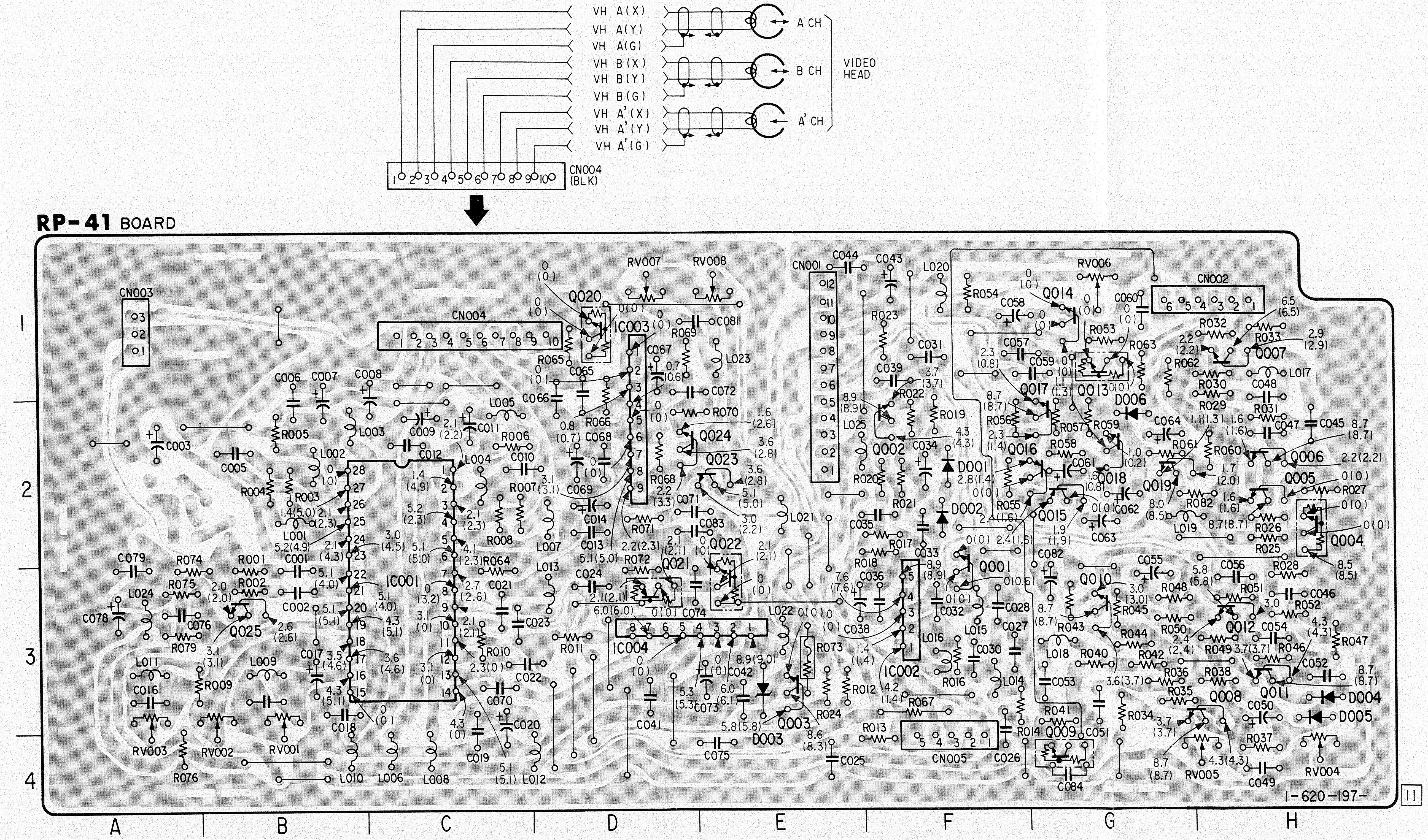

VH A(X)
VH A(Y)
VH A(G)
VH B(X)
VH B(Y)
VH B(G)
VH A'(X)
VH A'(Y)
VH A'(G)
CN004 (BLK)
RP-41 BOARD
CN003
CN004
IC001
IC003
IC004
Q020
Q021
Q022
Q023
Q024
Q025
RV001
RV002
RV003
RV007
RV008
L001
L002
L003
L004
L005
L006
L007
L008
L009
L010
L011
L012
L013
L023
L024
1
2
3
4
A
B
C
D

DIAGRAM

RP-41(HEAD AMP) PRINTED WIRING BOARD

—Ref. No. RP-41 BOARD : 2,000 series—

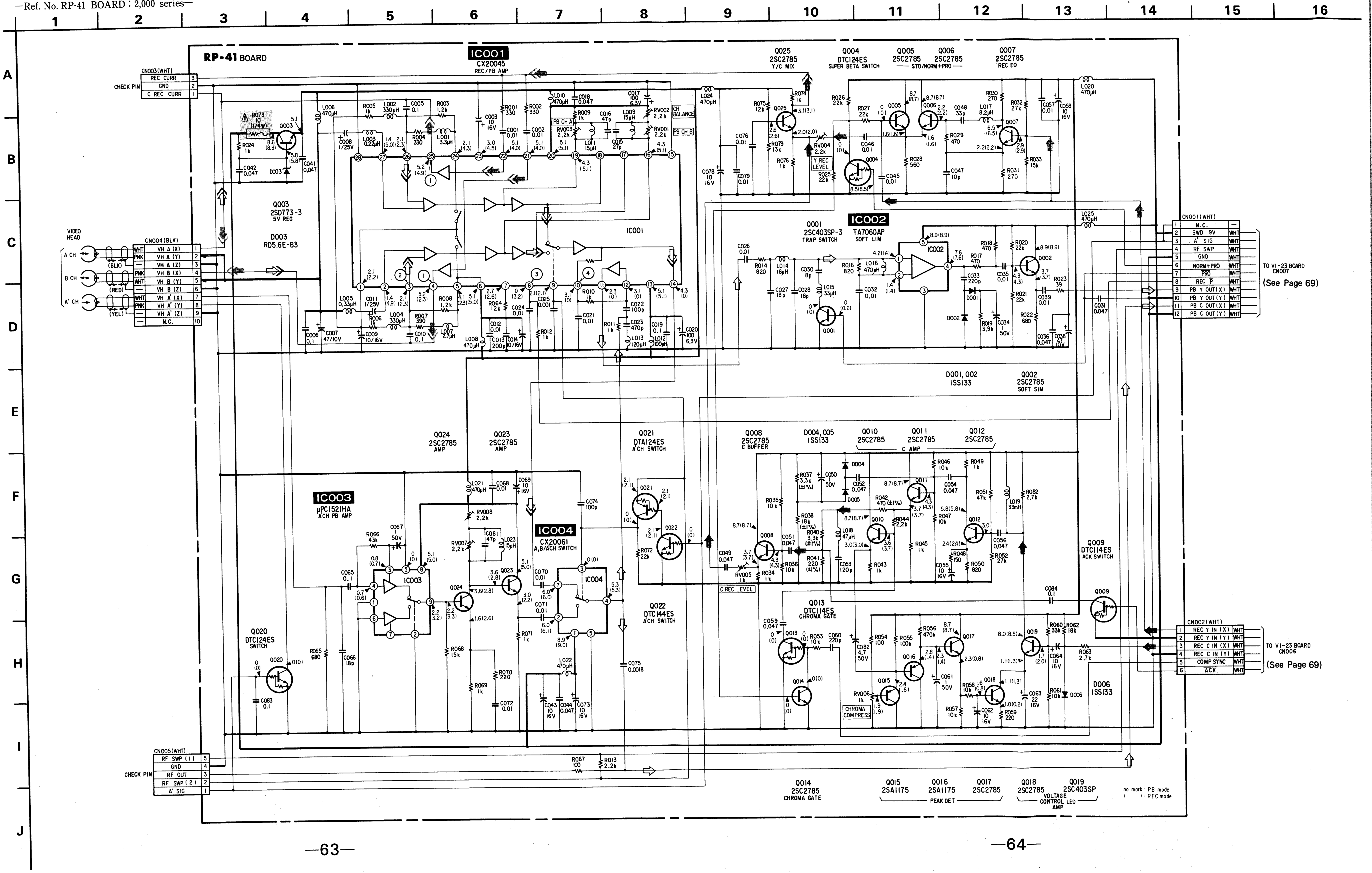
D001	F-2
D002	F-2
D003	E-3
D004	H-3
D005	H-3
D006	G-2
IC001	C-3
IC002	F-3
IC003	D-2
IC004	D-3
Q001	F-3
Q002	F-2
Q003	E-3
Q004	H-2
Q005	H-2
Q006	H-2
Q007	H-1
Q008	H-3
Q010	G-3
Q011	H-3
Q012	H-3
Q013	G-1
Q014	G-1
Q015	G-2
Q016	G-2
Q017	G-2
Q018	G-2
Q019	G-2
Q020	D-1
Q021	D-3
Q022	E-3
Q023	E-2
Q024	D-2
Q025	B-3
RV001	A-3
RV002	B-3
RV003	B-3
RV004	H-4
RV005	H-4
RV006	G-1
RV007	D-1
RV008	E-1

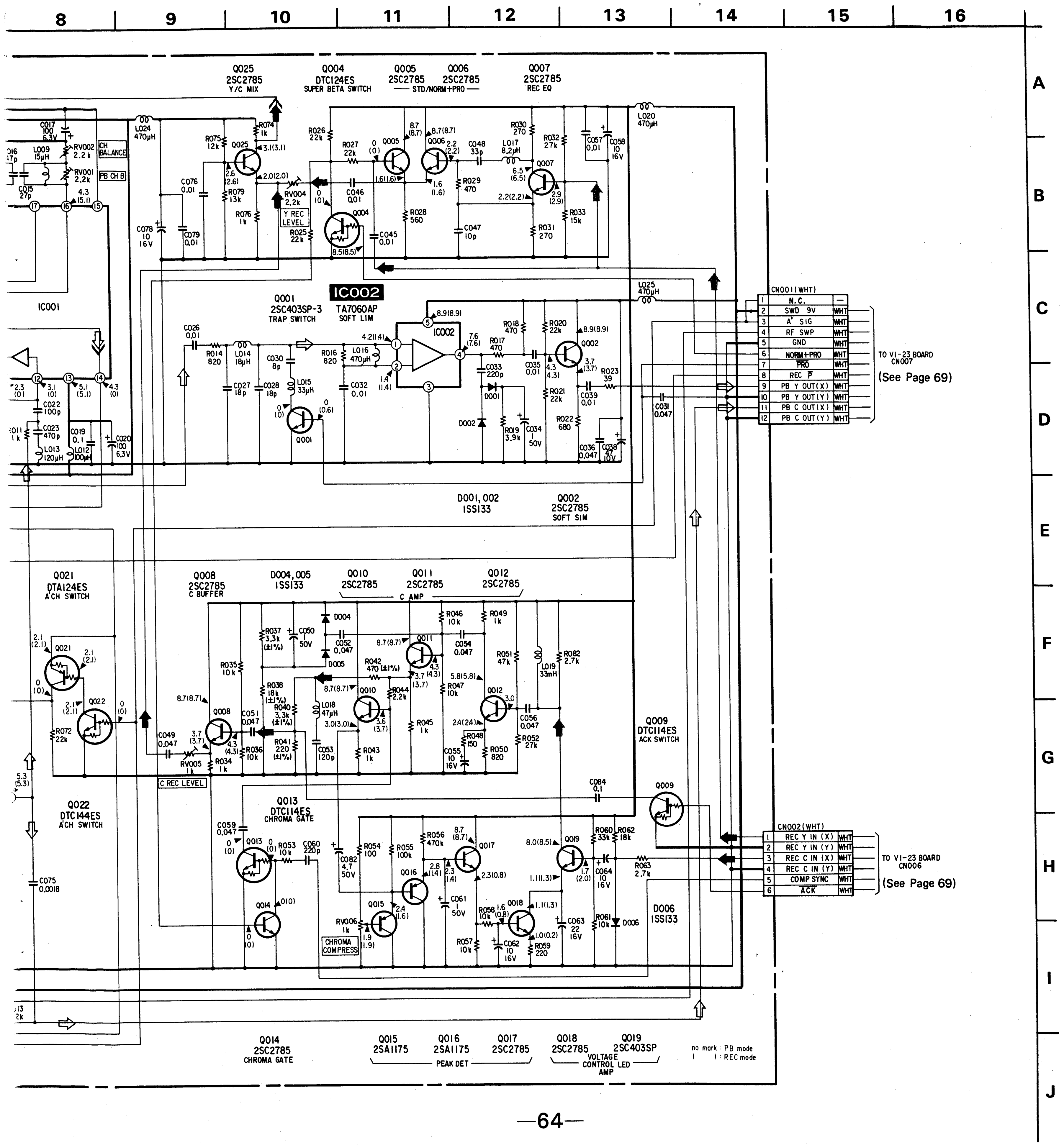

VH A(X)
VH A(Y)
VH A(G)
VH B(X)
VH B(Y)
VH B(G)
VH A'(X)
VH A'(Y)
VH A'(G)
A CH
B CH
A' CH
VIDEO HEAD
CN004 (BLK)
RP-41 BOARD
CN003
CN004
CN001
CN002
CN005
IC001
IC002
IC003
IC004
Q020
Q024
Q023
Q021
Q022
Q025
Q002
Q001
Q003
Q014
Q017
Q013
Q016
Q018
Q015
Q019
Q010
Q009
Q007
Q006
Q005
Q004
Q012
Q011
Q008
D001
D002
D003
D004
D005
D006
RV001
RV002
RV003
RV004
RV005
RV006
RV007
RV008
1-620-197-
11
A
B
C
D
E
F
G
H
1
2
3
4

no mark : PB mode
( ) : REC mode

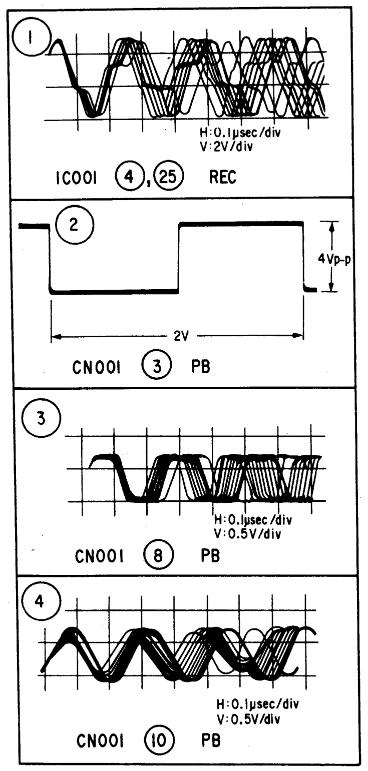
RP-41 (HEAD AMP) SCHEMATIC DIAGRAM

—Ref. No. RP-41 BOARD : 2,000 series—


RP-41 BOARD
IC001 CX20045 REC/PB AMP
IC002 TA7060AP SOFT LIM
IC003 μPC1521HA A'CH PB AMP
IC004 CX20061 A,B/A'CH SWITCH
Q003 2SD773-3 5V REG
D003 RD5.6E-B3
Q025 2SC2785 Y/C MIX
Q004 DTC124ES SUPER BETA SWITCH
Q005 2SC2785
Q006 2SC2785
STD/NORM+PRO
Q007 2SC2785 REC EQ
Q001 2SC403SP-3 TRAP SWITCH
D001,002 1SS133
Q002 2SC2785 SOFT SIM
Q024 2SC2785 AMP
Q023 2SC2785 AMP
Q021 DTA124ES A'CH SWITCH
Q022 DTC144ES A'CH SWITCH
Q020 DTC124ES SWITCH
Q008 2SC2785 C BUFFER
D004,005 1SS133
Q010 2SC2785
Q011 2SC2785
Q012 2SC2785
C AMP
Q009 DTC114ES ACK SWITCH
Q013 DTC114ES CHROMA GATE
D006 1SS133
Q014 2SC2785 CHROMA GATE
Q015 2SA1175
Q016 2SA1175
PEAK DET
Q017 2SC2785
Q018 2SC2785
Q019 2SC403SP
VOLTAGE CONTROL LED AMP
no mark : PB mode
( ) : REC mode
CN003(WHT)
1 C REC CURR
2 GND
3 REC CURR
CHECK PIN
VIDEO HEAD
A CH
B CH
A' CH
(BLK)
(RED)
(YEL)
CN004(BLK)
1 WHT VH A (X)
2 PNK VH A (Y)
3 — VH A (Z)
4 PNK VH B (X)
5 WHT VH B (Y)
6 — VH B (Z)
7 WHT VH A' (X)
8 PNK VH A' (Y)
9 — VH A' (Z)
10 — N.C.
CN001(WHT)
1 N.C.
2 SWD 9V
3 A' SIG
4 RF SWP
5 GND
6 NORM+PRO
7 PRO
8 REC P
9 PB Y OUT(X)
10 PB Y OUT(Y)
11 PB C OUT(X)
12 PB C OUT(Y)
TO VI-23 BOARD CN007
(See Page 69)
CN002(WHT)
1 REC Y IN (X)
2 REC Y IN (Y)
3 REC C IN (X)
4 REC C IN (Y)
5 COMP SYNC
6 ACK
TO VI-23 BOARD CN006
(See Page 69)
CN005(WHT)
5 RF SWP (1)
4 GND
3 RF OUT
2 RF SWP (2)
1 A' SIG
CH BALANCE
PB CH A
PB CH B
Y REC LEVEL
C REC LEVEL
CHROMA COMPRESS
RV001 2.2k
RV002 2.2k
RV003 2.2k
RV004 2.2k
RV005 1k
RV006 1k
RV007 2.2k
RV008 2.2k
R073 10 (1/4W)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J


8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
Q025 2SC2785 Y/C MIX
Q004 DTC124ES SUPER BETA SWITCH
Q005 2SC2785
Q006 2SC2785
STD/NORM+PRO
Q007 2SC2785 REC EQ
CH BALANCE
PB CH B
Y REC LEVEL
IC001
Q001 2SC403SP-3 TRAP SWITCH
IC002 TA7060AP SOFT LIM
D001, 002 1SS133
Q002 2SC2785 SOFT SIM
CN001 (WHT)
1 N.C.
2 SWD 9V
3 A' SIG
4 RF SWP
5 GND
6 NORM+PRO
7 PRO
8 REC P
9 PB Y OUT (X)
10 PB Y OUT (Y)
11 PB C OUT (X)
12 PB C OUT (Y)
TO VI-23 BOARD CN007
(See Page 69)
Q021 DTA124ES A CH SWITCH
Q022 DTC144ES A CH SWITCH
Q008 2SC2785 C BUFFER
D004, 005 1SS133
Q010 2SC2785
Q011 2SC2785
Q012 2SC2785
C AMP
Q009 DTC114ES ACK SWITCH
C REC LEVEL
Q013 DTC114ES CHROMA GATE
CHROMA COMPRESS
D006 1SS133
CN002 (WHT)
1 REC Y IN (X)
2 REC Y IN (Y)
3 REC C IN (X)
4 REC C IN (Y)
5 COMP SYNC
6 ACK
TO VI-23 BOARD CN006
(See Page 69)
Q014 2SC2785 CHROMA GATE
Q015 2SA1175
Q016 2SA1175
Q017 2SC2785
PEAK DET
Q018 2SC2785
Q019 2SC403SP
VOLTAGE CONTROL LED AMP
no mark : PB mode
( ) : REC mode

RP-41 BOARD



Note:

- All resistors are in ohms, 1/6W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in µF unless otherwise noted. pF : µµF 50WV or less are not indicated except for electrolytics. and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair.
- ━ : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

When indicating parts by reference number, please include the board name.

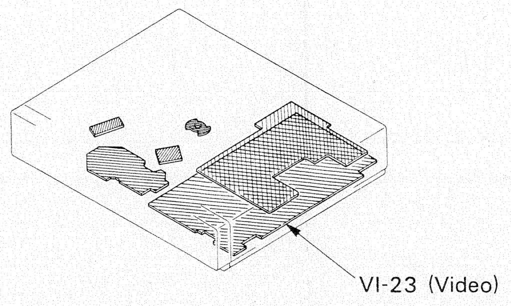
- **Signal path**
  - ➡ : REC Y Signal
  - ⇨ : PB Y Signal
  - ➡ : REC CHROMA Signal
  - ⇨ : PB CHROMA Signal
  - ➡ : REC Y/CHROMA Signal
  - ⇨ : PB Y/CHROMA Signal

VI-23(VIDEO) PRINTED WIRING BOARD

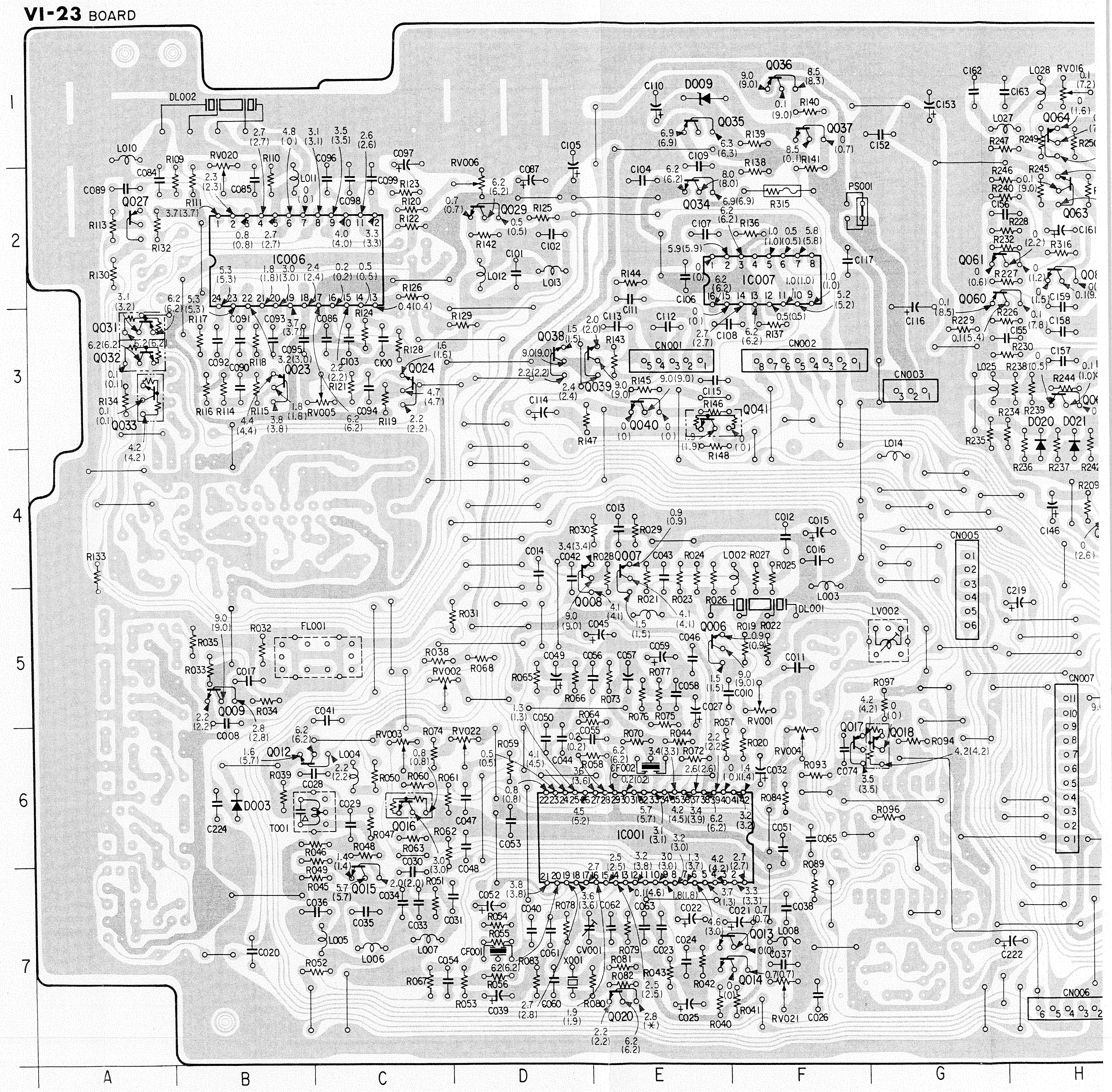
—Ref. No. 3,000 series—

Note:

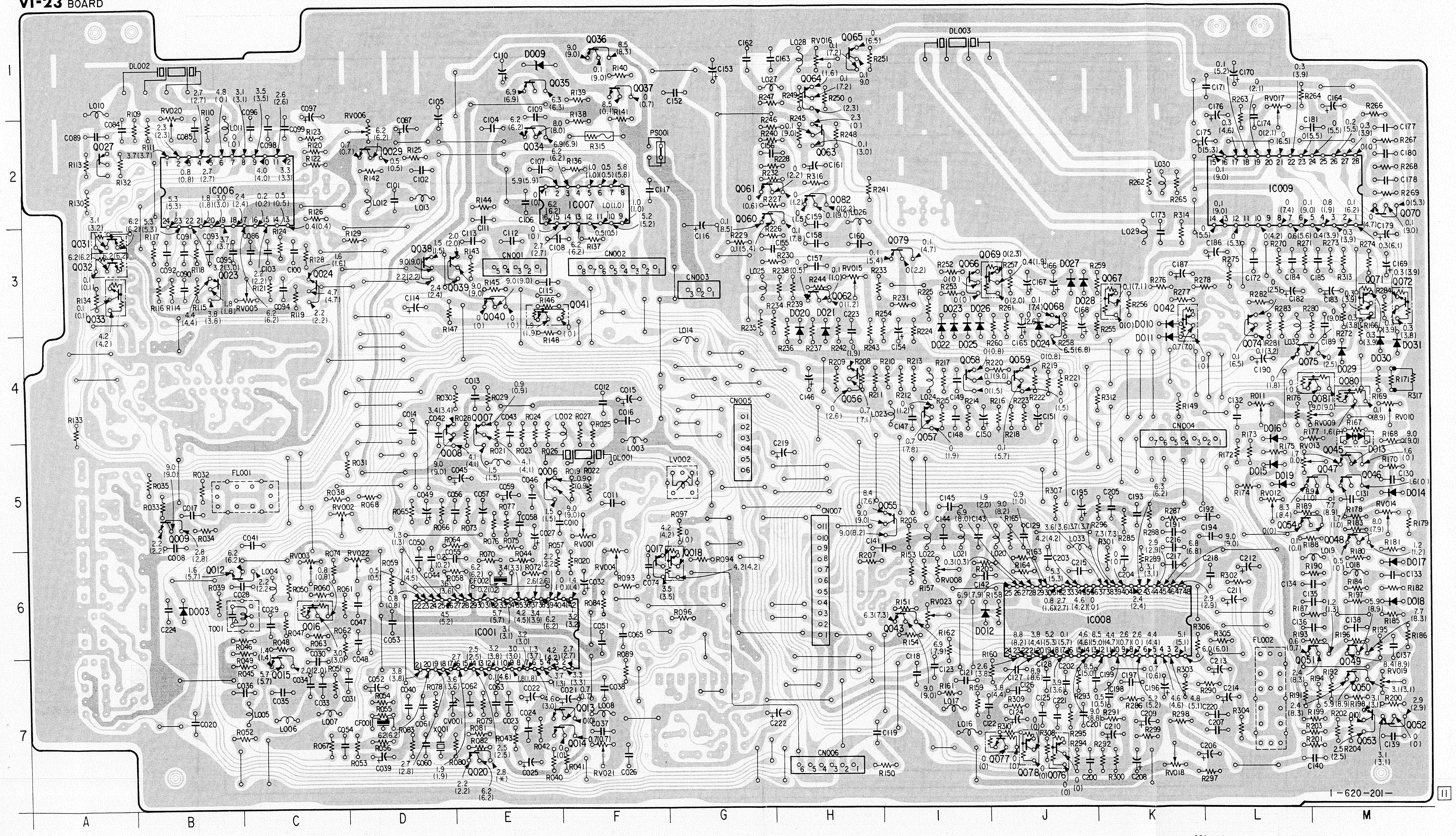
- ○— : indicates a lead wire mounted on the component side.
- ▨ : Pattern from the side which enables seeing.
- ▩ : B+ pattern from the side which enables seeing.



CV001	D-7
D003	B-6
D009	E-1
D010	K-3
D011	K-4
D012	I-6
D013	M-5
D014	M-5
D015	L-5
D016	L-5
D017	M-6
D018	M-6
D019	L-5
D020	H-3
D021	H-3
D022	I-3
D023	I-3
D024	J-3
D025	I-3
D026	I-3
D027	J-3
D028	J-3
D029	M-4
D030	M-4
D031	M-4
IC001	E-6
IC006	B-2
IC007	F-2
IC008	K-6
IC009	L-2
LV002	G-5
Q006	E-5
Q007	E-4
Q008	E-4
Q009	B-5
Q012	C-6
Q013	D-7
Q014	D-7
Q015	C-7
Q016	C-6
Q017	F-6
Q018	G-6
Q020	E-7
Q023	B-3
Q024	C-3
Q027	A-2
Q029	D-2
Q031	A-3
Q032	A-3
Q033	A-3
Q034	E-2
Q035	E-1
Q036	F-1
Q037	F-1
Q038	D-3
Q039	E-3
Q040	E-3
Q041	E-3
Q042	K-3
Q043	I-6
Q045	M-5
Q046	M-5
Q047	M-5
Q048	M-6
Q049	M-7
Q050	M-7
Q051	M-7
Q052	M-7
Q053	M-7
Q054	L-5
Q055	I-5
Q056	H-4
Q057	I-4
Q058	I-4
Q059	J-4
Q060	G-2
Q061	G-2
Q062	H-3
Q063	H-2
Q064	H-1
Q065	H-1
Q066	I-3
Q067	K-3
Q068	J-3
Q069	J-3
Q070	M-2
Q071	M-3
Q072	M-3
Q074	L-3
Q075	L-4
Q076	J-7
Q077	J-7
Q078	J-7
Q079	I-3
Q080	M-4
Q081	M-4
Q082	H-2
RV001	F-5
RV002	C-5
RV003	C-6
RV004	F-6
RV005	C-3
RV006	D-2
RV008	I-6
RV009	M-4
RV010	M-4
RV011	L-4
RV012	L-5
RV013	L-5
RV014	M-5
RV015	H-3
RV016	H-1
RV017	L-1
RV018	K-7
RV019	M-7
RV020	B-1
RV021	F-7
RV022	D-6
RV023	I-6


VI-23 BOARD
1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
IC001
IC006
IC007
DL001
DL002
FL001
PS001
LV002
CN001
CN002
CN003
CN005
CN006
CN007
Q006
Q007
Q008
Q009
Q012
Q013
Q014
Q015
Q016
Q017
Q018
Q020
Q023
Q024
Q027
Q029
Q031
Q032
Q033
Q034
Q035
Q036
Q037
Q038
Q039
Q040
Q041
Q060
Q061
Q063
Q064
D003
D009
D020
D021
RV001
RV002
RV003
RV004
RV005
RV006
RV016
RV020
RV021
RV022
X001
CV001
T001
L010
L011
L012
L013
L014
L025
L027
L028
L002
L003
L004
L005
L006
L007
L008

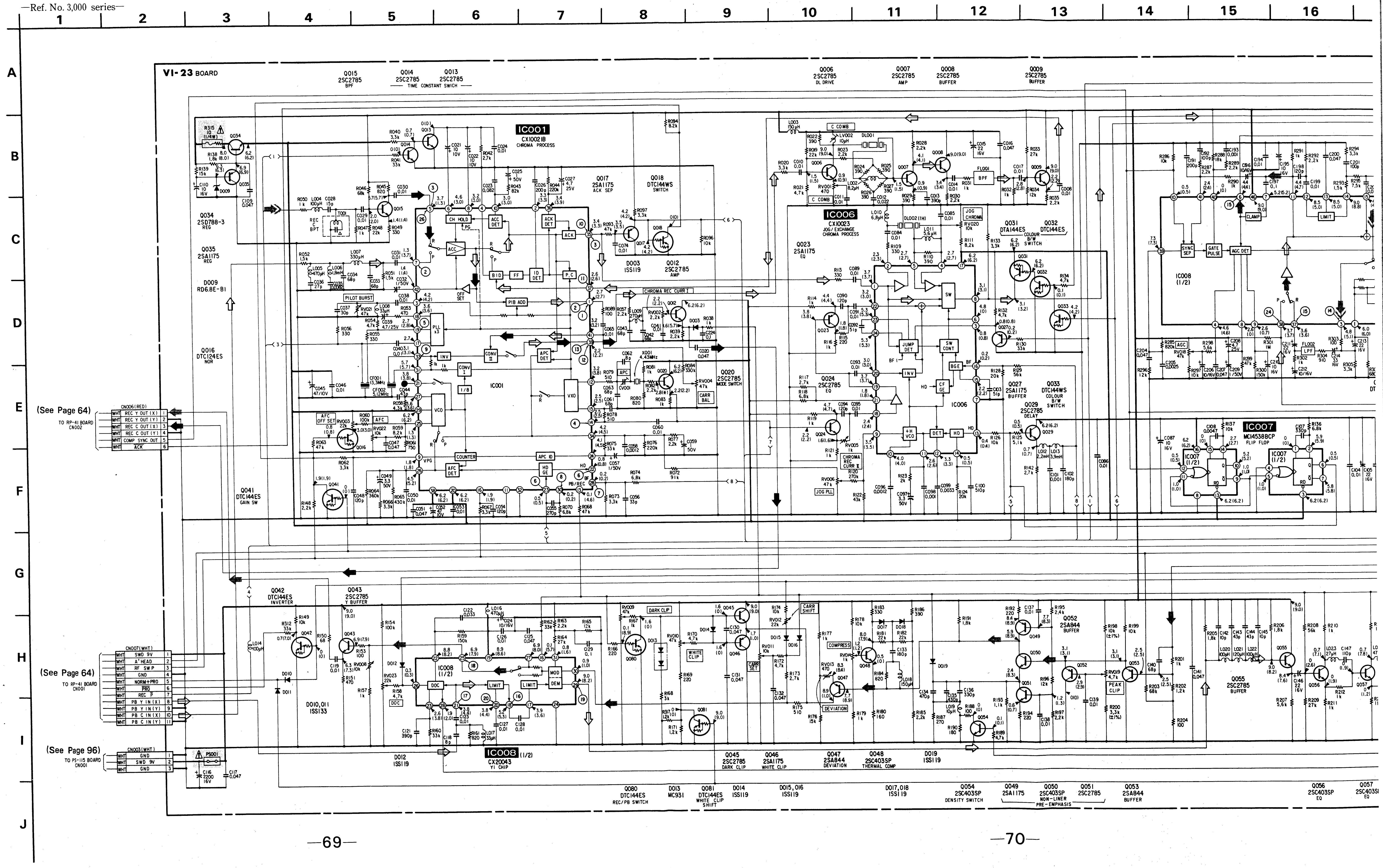
VI-23 BOARD

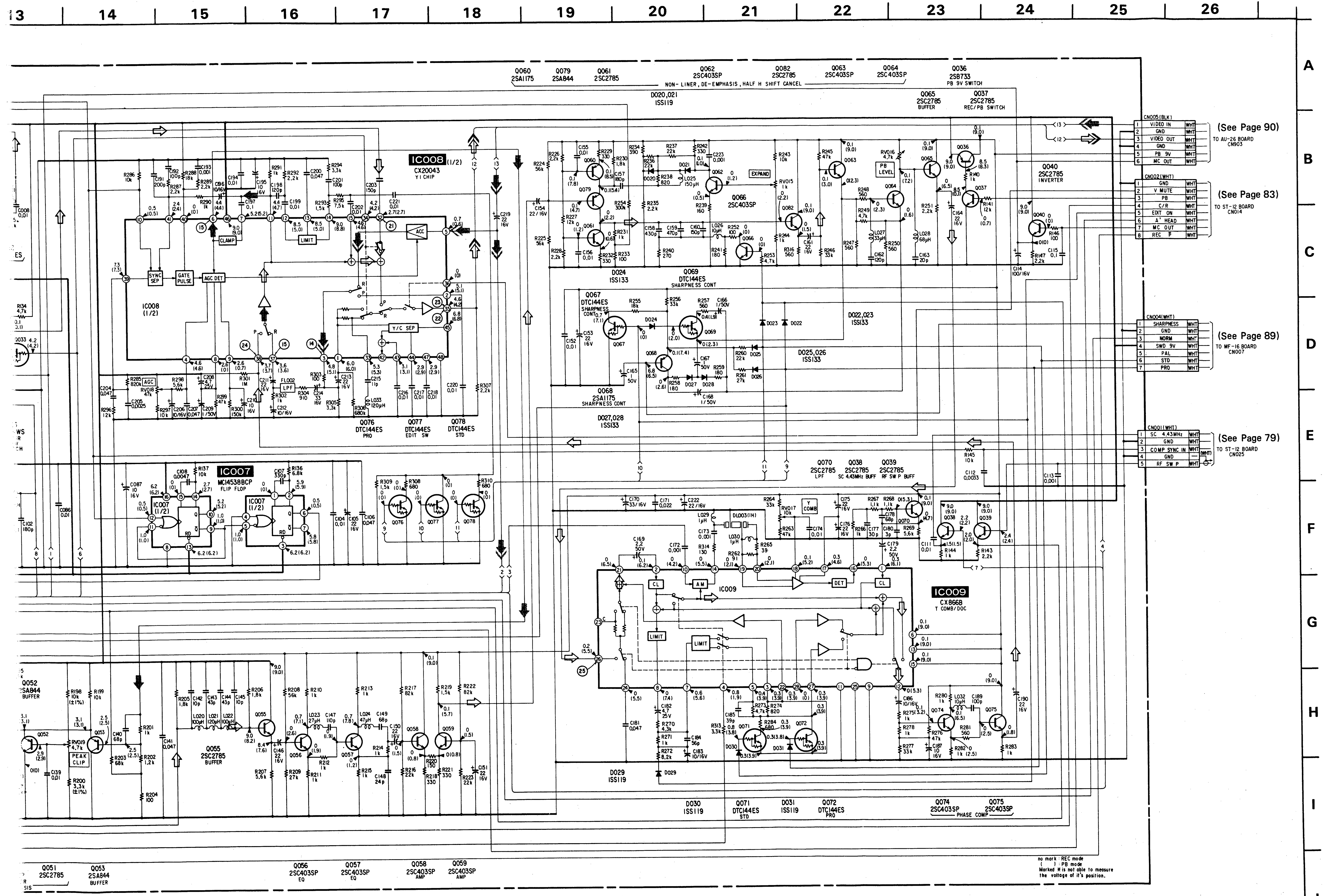

IC001
IC006
IC007
IC008
IC009
CN001
CN002
CN003
CN004
CN005
CN006
CN007
DL001
DL002
DL003
FL001
FL002
LV002
PS001
T001
X001
CF001
CF002
1-620-201-
11
1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
J
K
L
M

no mark : REC mode
( ) : PB mode
Marked ✱ is not able to measure the voltage of it's position.

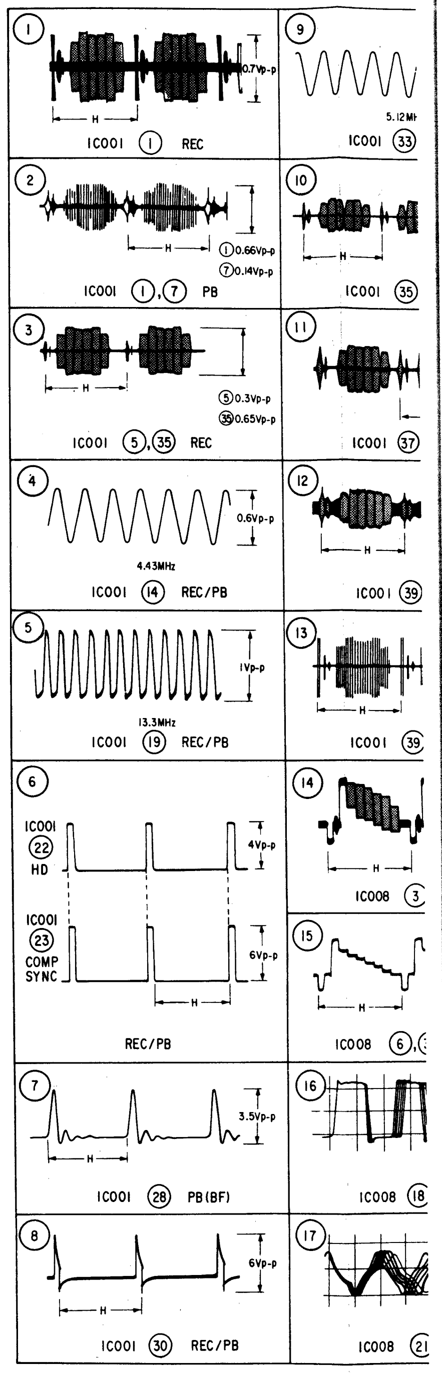
VI-23(VIDEO) SCHEMATIC DIAGRAM

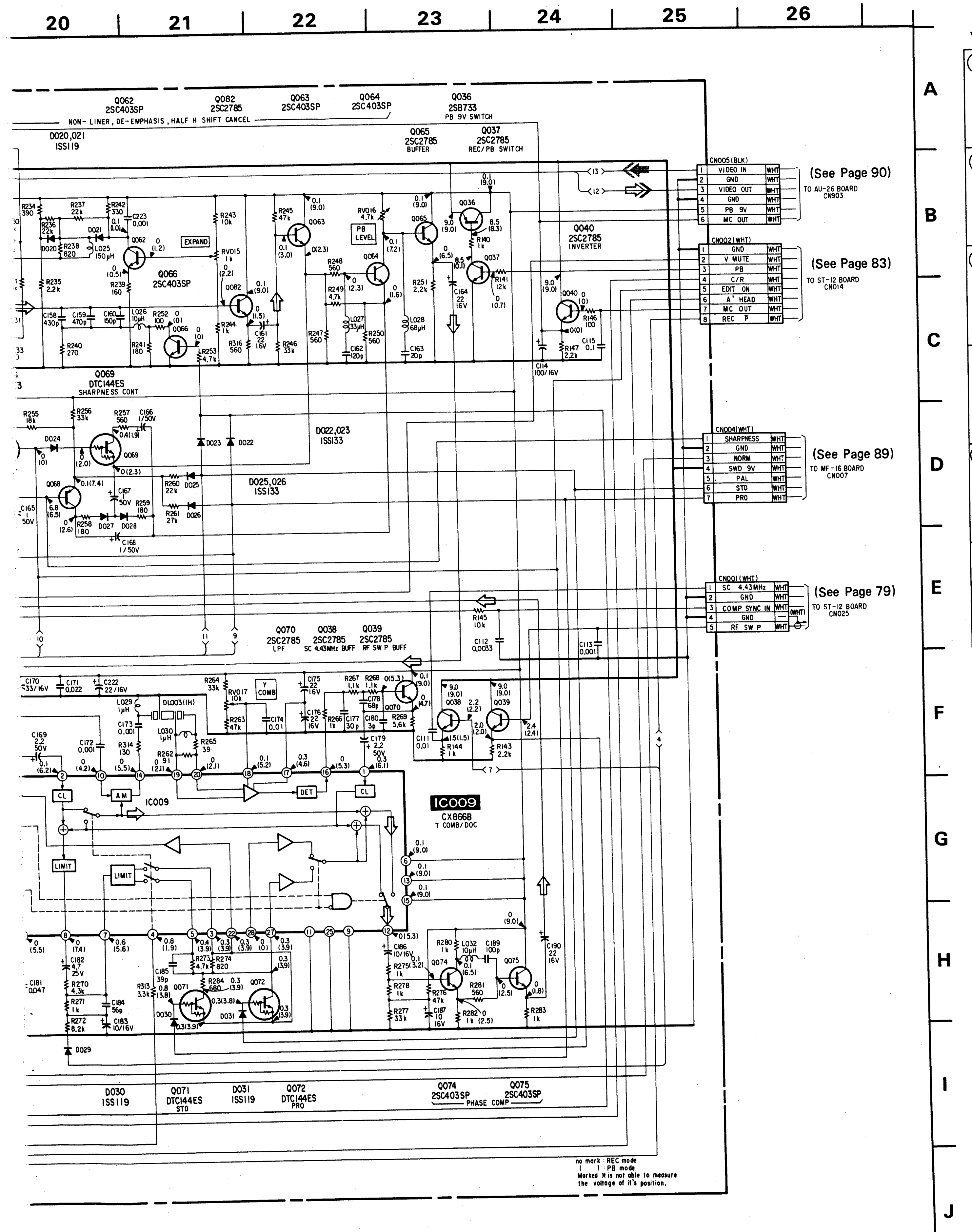
—Ref. No. 3,000 series—


VI-23 BOARD
IC001 CX10021B CHROMA PROCESS
IC006 CX10023 JOG/EXCHANGE CHROMA PROCESS
IC007 MC14538BCP FLIP FLOP
IC008 (1/2) CX20043 Y1 CHIP
IC008 (1/2)
Q015 2SC2785 BPF
Q014 2SC2785
Q013 2SC2785
TIME CONSTANT SWICH
Q006 2SC2785 DL DRIVE
Q007 2SC2785 AMP
Q008 2SC2785 BUFFER
Q009 2SC2785 BUFFER
Q017 2SA1175 ACK SEP
Q018 DTC144WS SWITCH
Q034 2SD788-3 REG
Q035 2SA1175 REG
D009 RD6.8E-B1
Q016 DTC124ES NOR
Q041 DTC144ES GAIN SW
D003 1SS119
Q012 2SC2785 AMP
Q020 2SC2785 MODE SWITCH
Q023 2SA1175 EQ
Q024 2SC2785 EQ
Q027 2SA1175 BUFFER
Q029 2SC2785 DELAY
Q031 DTA144ES
Q032 DTC144ES
COLOUR B/W SWITCH
Q033 DTC144WS COLOUR B/W SWITCH
IC008 (1/2)
Q042 DTC144ES INVERTER
Q043 2SC2785 Y BUFFER
D010,011 1SS133
D012 1SS119
Q052 2SA844 BUFFER
Q055 2SC2785 BUFFER
Q045 2SC2785 DARK CLIP
Q046 2SA1175 WHITE CLIP
Q047 2SA844 DEVIATION
Q048 2SC403SP THERMAL COMP
D019 1SS119
Q080 DTC144ES REC/PB SWITCH
D013 MC931
Q081 DTC144ES WHITE CLIP SHIFT
D014 1SS119
D015,016 1SS119
D017,018 1SS119
Q054 2SC403SP DENSITY SWITCH
Q049 2SA1175
Q050 2SC403SP
Q051 2SC2785
NON-LINER PRE-EMPHASIS
Q053 2SA844 BUFFER
Q056 2SC403SP EQ
Q057 2SC403SP EQ
(See Page 64) TO RP-41 BOARD CN002
CN006 (RED)
REC Y OUT (X)
REC Y OUT (Y)
REC C OUT (X)
REC C OUT (Y)
COMP SYNC OUT
ACK
(See Page 64) TO RP-41 BOARD CN001
CN007 (WHT)
SWD 9V
A' HEAD
RF SW P
GND
NORM+PRO
PRO
REC P
PB Y IN (X)
PB Y IN (Y)
PB C IN (X)
PB C IN (Y)
(See Page 96) TO PS-115 BOARD CN001
CN003 (WHT)
GND
SWD 9V
GND
PS001
CH HOLD
ACC DET
ACK DET
ACK
ACC
PILOT BURST
PLL x3
PIB ADD
CONV II
APC DET
INV
CONV I
1/8
VXO
VCO
AFC OFF SET
AFC
COUNTER
AFC DET
APC ID
HD GE
CARR BAL
CHROMA REC CURR I
C COMB
DL001
BPF
JOG CHROMA
SW
JUMP DET
SW CONT
BGE
CF GE
+H VCO
DET
HD
CHROMA REC CURR II
JOG PLL
SYNC SEP
GATE PULSE
AGC DET
CLAMP
LIMIT
LPF
DARK CLIP
WHITE CLIP
CARR SHIFT
COMPRESS
DEVIATION
DOC
LIMIT
MOD
DEM
PEAK CLIP
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J

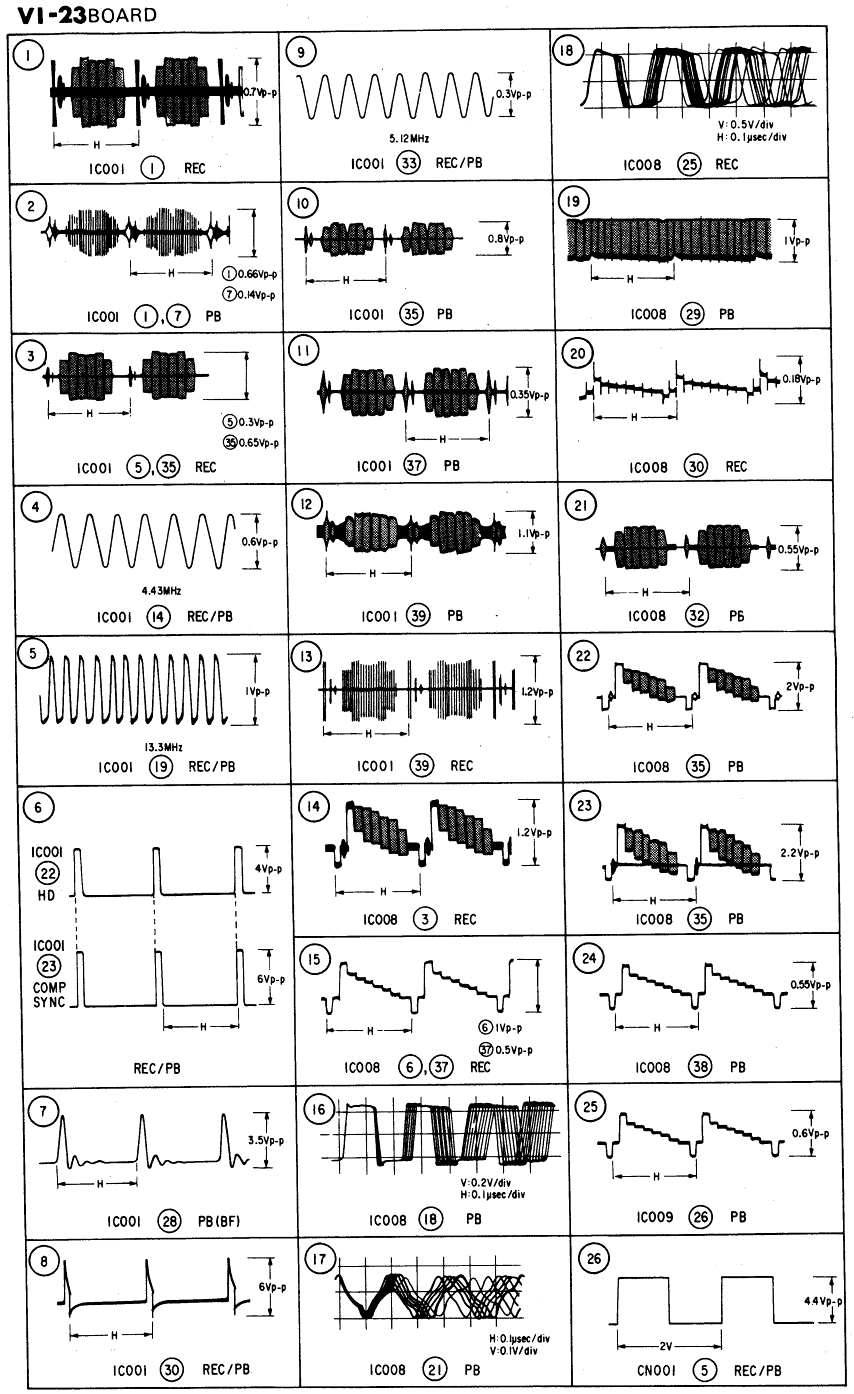

13
14
15
16
17
18
19
20
21
22
23
24
25
26
A
B
C
D
E
F
G
H
I
J
Q060 2SA1175
Q079 2SA844
Q061 2SC2785
Q062 2SC403SP
Q082 2SC2785
Q063 2SC403SP
Q064 2SC403SP
Q036 2SB733 PB 9V SWITCH
NON-LINER, DE-EMPHASIS, HALF H SHIFT CANCEL
D020,021 1SS119
Q065 2SC2785 BUFFER
Q037 2SC2785 REC/PB SWITCH
Q040 2SC2785 INVERTER
IC008 (1/2)
CX20043
Y1 CHIP
CLAMP
LIMIT
ACC
SYNC SEP
GATE PULSE
AGC DET
AGC
LPF
Y/C SEP
EXPAND
PB LEVEL
Q066 2SC403SP
D024 1SS133
Q069 DTC144ES SHARPNESS CONT
Q067 DTC144ES SHARPNESS CONT
Q068 2SA1175 SHARPNESS CONT
D022,023 1SS133
D025,026 1SS133
D027,028 1SS133
Q076 DTC144ES PRO
Q077 DTC144ES EDIT SW
Q078 DTC144ES STD
CN005(BLK)
1 VIDEO IN
2 GND
3 VIDEO OUT
4 GND
5 PB 9V
6 MC OUT
(See Page 90)
TO AU-26 BOARD CN903
CN002(WHT)
1 GND
2 V MUTE
3 PB
4 C/R
5 EDIT ON
6 A' HEAD
7 MC OUT
8 REC P
(See Page 83)
TO ST-12 BOARD CN014
CN004(WHT)
1 SHARPNESS
2 GND
3 NORM
4 SWD 9V
5 PAL
6 STD
7 PRO
(See Page 89)
TO MF-16 BOARD CN007
CN001(WHT)
1 SC 4.43MHz
2 GND
3 COMP SYNC IN
4 GND
5 RF SW P
(See Page 79)
TO ST-12 BOARD CN025
IC007
MC14538BCP
FLIP FLOP
IC007 (1/2)
Q070 2SC2785 LPF
Q038 2SC2785 SC 4.43MHz BUFF
Q039 2SC2785 RF SW P BUFF
Y COMB
IC009
CX866B
T COMB/DOC
CL
AM
DET
LIMIT
PEAK CLIP
Q052 2SA844 BUFFER
Q055 2SC2785 BUFFER
D029 1SS119
D030 1SS119
Q071 DTC144ES STD
D031 1SS119
Q072 DTC144ES PRO
Q074 2SC403SP
Q075 2SC403SP
PHASE COMP
Q051 2SC2785
Q053 2SA844 BUFFER
Q056 2SC403SP EQ
Q057 2SC403SP EQ
Q058 2SC403SP AMP
Q059 2SC403SP AMP
no mark : REC mode
( ) : PB mode
Marked ※ is not able to measure the voltage of it's position.

VI-23BOARD


① 0.7Vp-p H IC001 ① REC
⑨ 5.12MHz IC001 ㉝
② H ①0.66Vp-p ⑦0.14Vp-p IC001 ①,⑦ PB
⑩ H IC001 ㉟
③ H ⑤0.3Vp-p ㉟0.65Vp-p IC001 ⑤,㉟ REC
⑪ IC001 ㊲
④ 0.6Vp-p 4.43MHz IC001 ⑭ REC/PB
⑫ H IC001 ㊴
⑤ 1Vp-p 13.3MHz IC001 ⑲ REC/PB
⑬ H IC001 ㊴
⑥ IC001 ㉒ HD 4Vp-p IC001 ㉓ COMP SYNC 6Vp-p H REC/PB
⑭ IC008 ③
⑮ H IC008 ⑥
⑦ 3.5Vp-p H IC001 ㉘ PB(BF)
⑯ IC008 ⑱
⑧ 6Vp-p H IC001 ㉚ REC/PB
⑰ IC008 ㉑


20
21
22
23
24
25
26
A
B
C
D
E
F
G
H
I
J
Q062 2SC403SP
Q082 2SC2785
Q063 2SC403SP
Q064 2SC403SP
Q036 2SB733 PB 9V SWITCH
NON-LINER, DE-EMPHASIS, HALF H SHIFT CANCEL
D020,021 ISS119
Q065 2SC2785 BUFFER
Q037 2SC2785 REC/PB SWITCH
Q066 2SC403SP
Q040 2SC2785 INVERTER
EXPAND
PB LEVEL
Q069 DTC144ES SHARPNESS CONT
D022,023 ISS133
D025,026 ISS133
CN005(BLK)
1 VIDEO IN
2 GND
3 VIDEO OUT
4 GND
5 PB 9V
6 MC OUT
(See Page 90)
TO AU-26 BOARD CN903
CN002(WHT)
1 GND
2 V MUTE
3 PB
4 C/R
5 EDIT ON
6 A' HEAD
7 MC OUT
8 REC P
(See Page 83)
TO ST-12 BOARD CN014
CN004(WHT)
1 SHARPNESS
2 GND
3 NORM
4 SWD 9V
5 PAL
6 STD
7 PRO
(See Page 89)
TO MF-16 BOARD CN007
CN001(WHT)
1 SC 4.43MHz
2 GND
3 COMP SYNC IN
4 GND
5 RF SW P
(See Page 79)
TO ST-12 BOARD CN025
Q070 2SC2785 LPF
Q038 2SC2785 SC 4.43MHz BUFF
Q039 2SC2785 RF SW P BUFF
Y COMB
DL003(1H)
IC009
CX866B
T COMB/DOC
CL
AM
DET
LIMIT
D030 ISS119
Q071 DTC144ES STD
D031 ISS119
Q072 DTC144ES PRO
Q074 2SC403SP
Q075 2SC403SP
PHASE COMP
no mark : REC mode
( ) : PB mode
Marked * is not able to measure the voltage of it's position.

VI-23 BOARD



Note:

- All resistors are in ohms, 1/6W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics. and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊠ : nonflammable resistor.
- ⏦ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair.
- ━ : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

When indicating parts by reference number, please include the board name.

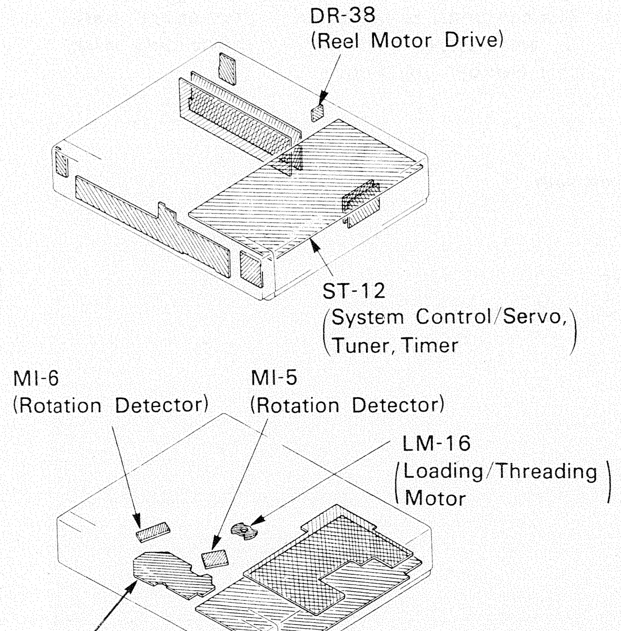
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

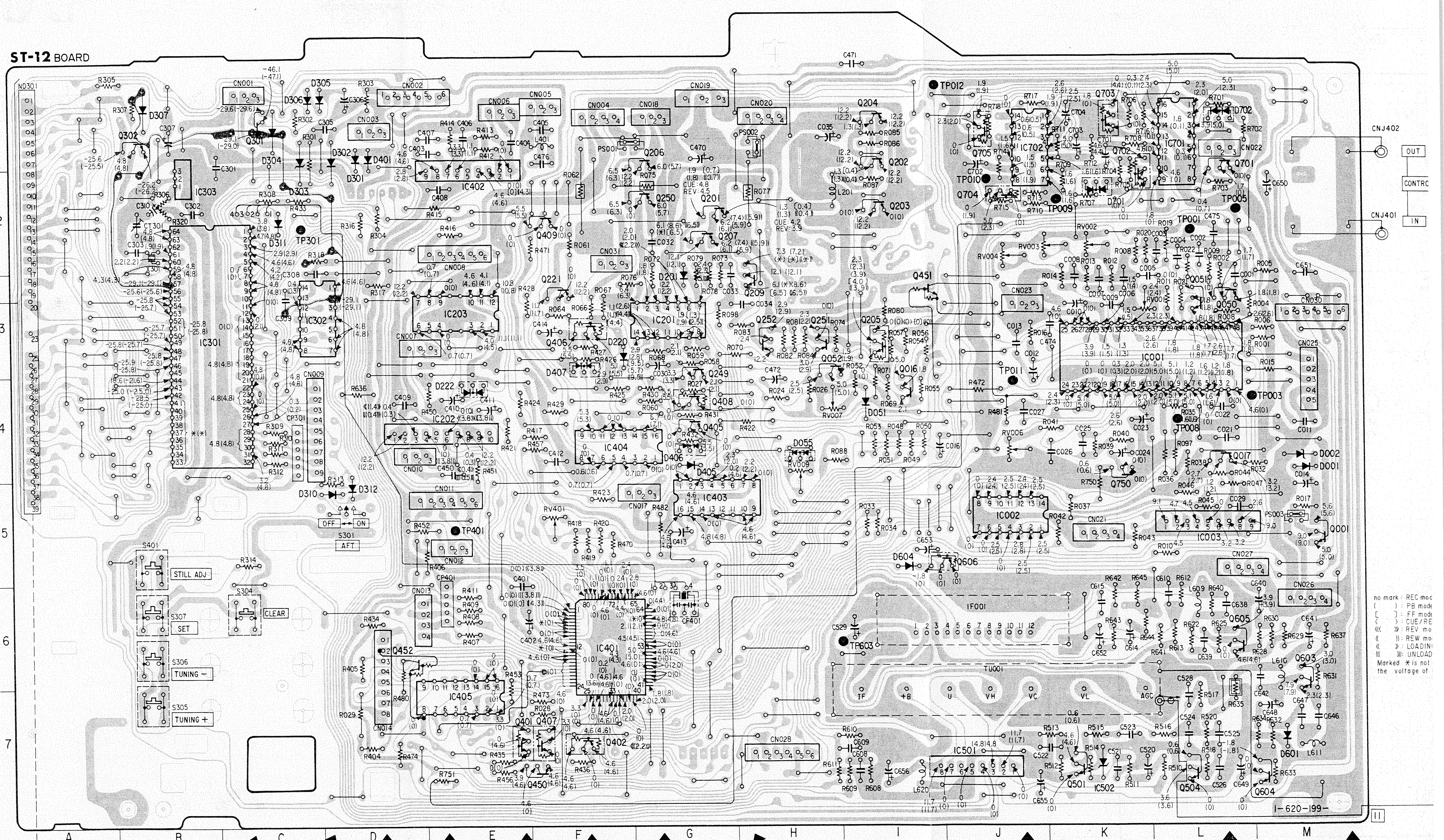
- **Signal path**
  - ➡ : REC Y Signal
  - ⇨ : PB Y Signal
  - ➡ : REC CHROMA Signal
  - ⇨ : PB CHROMA Signal
  - ➡ : REC Y/CHROMA Signal
  - ⇨ : PB Y/CHROMA Signal

ST-12 (SYSTEM CONTROL/SERVO, TUNER, TIMER) MI-5, MI-6 (ROTATION DETECTOR) DR-38 (REEL MOTOR DRIVE) LM-16 (LOADING/THREADING MOTOR) R STATOR (REEL MOTOR), CAPSTAN MOTOR PRINTED WIRING BOARDS

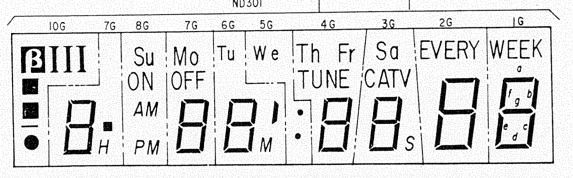
—Ref. No. R STATOR BOARD : 1,000 series, ST-12 BOARD : 5,000 series, MI-5, MI-6 BOARD : 7,000 series, DR-38 BOARD : 8,000 series—

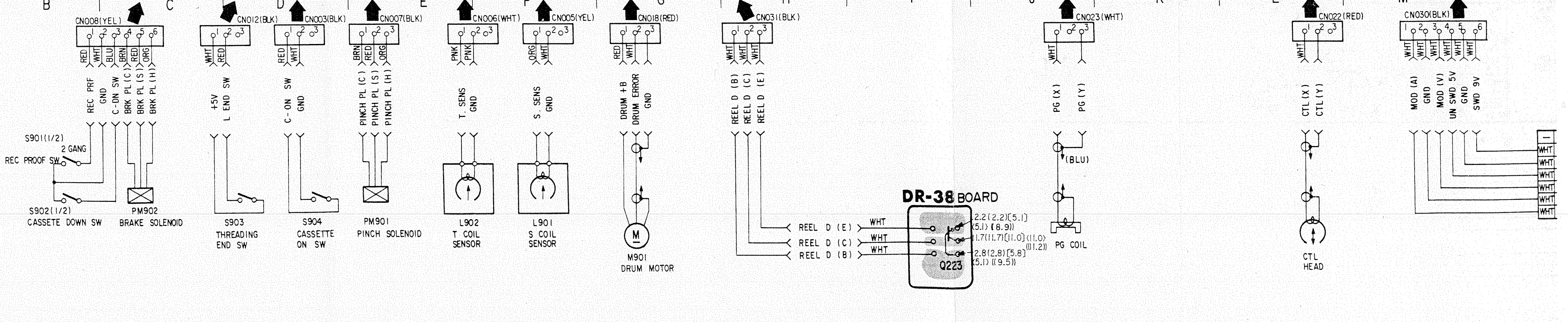
D001	M-4
D002	M-4
D051	I-3
D055	H-4
D201	G-2
D220	F-3
D222	E-3
D301	D-1
D302	D-1
D303	C-1
D304	C-1
D305	D-1
D306	C-1
D307	B-1
D310	D-4
D311	C-2
D312	D-4
D401	D-1
D405	G-4
D406	G-4
D407	F-3
D601	M-7
D604	I-5
D701	K-1
D702	L-1
IC001	L-3
IC002	J-5
IC003	L-5
IC201	G-3
IC202	E-4
IC203	E-3
IC301	B-3
IC302	C-3
IC303	B-1
IC401	F-6
IC402	E-1
IC403	G-4
IC404	F-4
IC405	E-6
IC501	J-7
IC502	K-7
IC701	L-1
IC702	J-1
Q001	M-5
Q016	I-3
Q017	L-4
Q050	L-2
Q051	L-2
Q052	H-3
Q201	G-2
Q202	I-1
Q203	I-2
Q204	I-1
Q205	I-3
Q206	G-1
Q207	G-2
Q209	H-2
Q221	F-2
Q249	G-3
Q250	G-1
Q251	H-3
Q252	H-3
Q301	C-1
Q302	B-1
Q401	E-7
Q402	F-7
Q405	G-4
Q406	F-3
Q407	F-7
Q408	G-3
Q409	F-2
Q450	F-7
Q451	I-3
R452	D-6
Q501	K-7
Q504	L-7
Q603	M-6
Q604	M-7
Q605	L-6
Q606	J-5
Q701	L-1
Q702	L-1
Q703	K-1
Q704	J-1
Q705	J-1
Q750	K-4
RV001	K-2
RV002	K-2
RV003	K-2
RV004	J-2
RV006	J-4
RV007	H-3
RV009	H-4
RV401	F-5
TP001	L-2
TP003	M-3
TP005	L-1
TP008	L-4
TP009	K-1
TP010	J-1
TP011	J-3
TP012	I-1
TP301	C-2
TP401	E-5
TP603	I-6


DR-38
(Reel Motor Drive)
ST-12
(System Control/Servo, Tuner, Timer)
MI-6
(Rotation Detector)
MI-5
(Rotation Detector)
LM-16
(Loading/Threading Motor)
R STATOR board
(Real Motor)


ST-12 BOARD
1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
J
K
L
M
ND301
CN001
CN002
CN003
CN004
CN005
CN006
CN007
CN008
CN009
CN010
CN011
CN012
CN013
CN014
CN017
CN018
CN019
CN020
CN021
CN022
CN023
CN025
CN026
CN027
CN028
CN031
CNJ402
OUT
CONTROL
CNJ401
IN
IC001
IC002
IC003
IC201
IC202
IC203
IC301
IC302
IC303
IC401
IC402
IC403
IC404
IC405
IC501
IC502
IC701
IC702
S401
STILL ADJ
S304
CLEAR
S307
SET
S306
TUNING −
S305
TUNING +
S301
AFT
OFF
ON
TP001
TP003
TP005
TP008
TP009
TP010
TP011
TP012
TP301
TP401
TP603
IF001
TU001
IF
+B
U
VH
VL
VC
AGC
1-620-199-
11

no mark : REC mod
( ) : PB mode
[ ] : FF mode
〈 〉 : CUE/RE
《〈 》〉 : REV mo
(( )) : REW mo
《 》 : LOADIN
((( ))) : UNLOAD
Marked ✱ is not
the voltage of

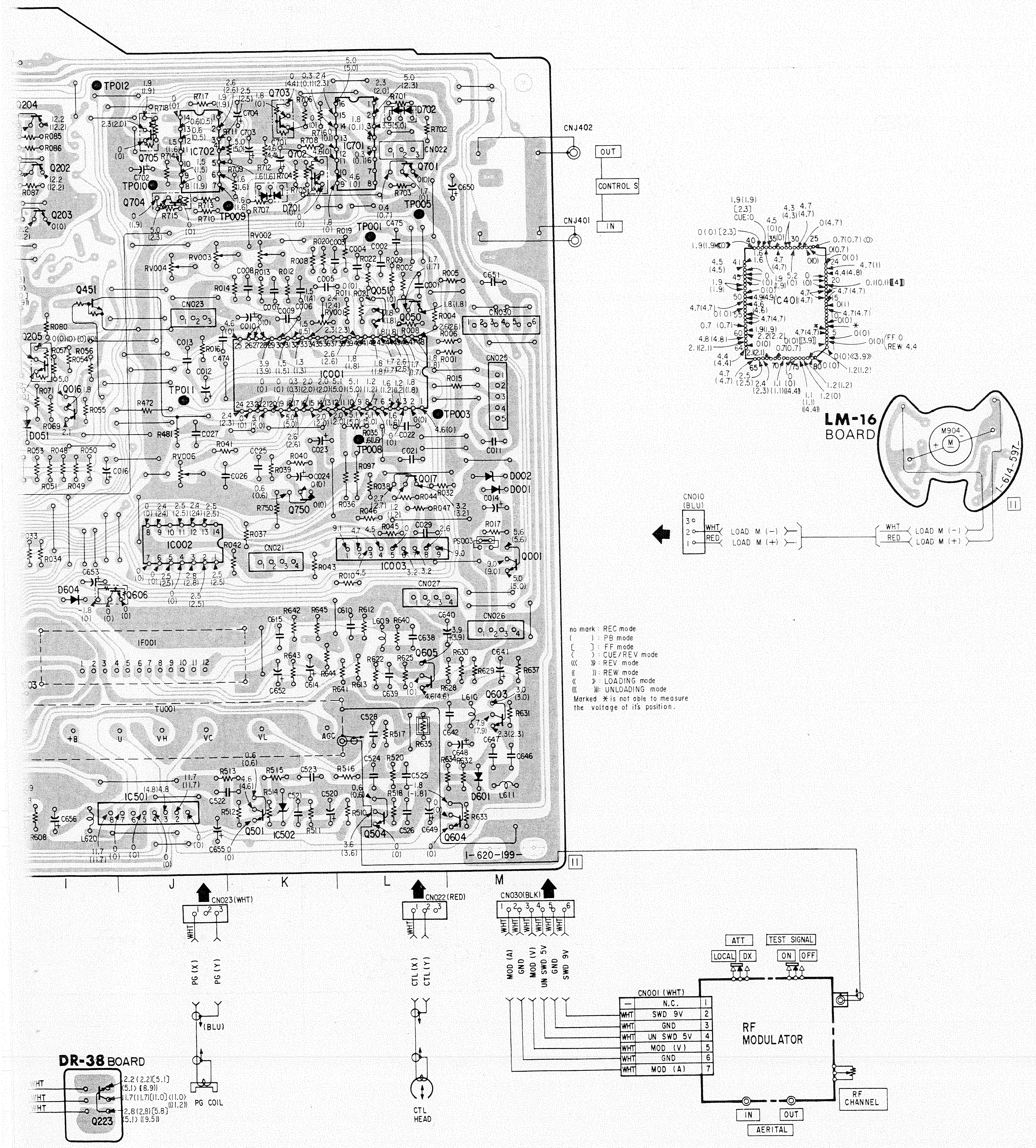

ND301
10G
7G
8G
7G
6G
5G
4G
3G
2G
1G
βIII
Su
ON
Mo
OFF
AM
PM
Tu
We
Th
Fr
TUNE
Sa
CATV
EVERY
WEEK
H
M
S
a
b
c
d
e
f
g


CN008(YEL)
RED
WHT
BLU
BRN
RED
ORG
REC PRF
GND
C-ON SW
BRK PL (C)
BRK PL (S)
BRK PL (H)
S901(1/2)
2 GANG
REC PROOF SW
S902(1/2)
CASSETE DOWN SW
PM902
BRAKE SOLENOID
CN012(BLK)
WHT
RED
+5V
L END SW
S903
THREADING END SW
CN003(BLK)
RED
WHT
C-ON SW
GND
S904
CASSETTE ON SW
CN007(BLK)
BRN
RED
ORG
PINCH PL (C)
PINCH PL (S)
PINCH PL (H)
PM901
PINCH SOLENOID
CN006(WHT)
PNK
PNK
T. SENS
GND
L902
T COIL SENSOR
CN005(YEL)
ORG
WHT
S. SENS
GND
L901
S COIL SENSOR
CN018(RED)
RED
WHT
DRUM +B
DRUM ERROR
GND
M901
DRUM MOTOR
CN031(BLK)
WHT
WHT
WHT
REEL D (B)
REEL D (C)
REEL D (E)
DR-38 BOARD
REEL D (E)
REEL D (C)
REEL D (B)
Q223
2.2(2.2)[5.1]〈5.1〉((8.9))
11.7(11.7)[11.0]〈11.0〉((11.2))
2.8(2.8)[5.8]〈5.1〉((9.5))
CN023(WHT)
PG (X)
PG (Y)
(BLU)
PG COIL
CN022(RED)
CTL (X)
CTL (Y)
CTL HEAD
CN030(BLK)
MOD (A)
GND
MOD (V)
UN SWD 5V
GND
SWD 9V

Note:

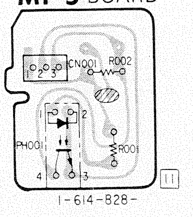
- ● ○— : indicates a lead wire mounted on the component side.
- ● ▨ : soldering side.
- ● ▨ : component side.
- ● ▨ : B+ Pattern.
- ● ▨ : B− Pattern.

OTOR), CAPSTAN MOTOR PRINTED WIRING BOARDS

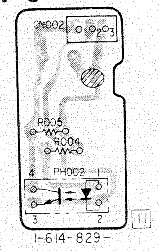

CNJ402
OUT
CONTROL S
CNJ401
IN
IC702
IC701
IC401
IC001
IC002
IC003
IC501
IC502
Q451
Q703
Q701
Q702
Q704
Q750
Q605
Q606
Q603
Q501
Q504
Q604
Q001
D002
D001
D051
D604
D601
TP001
TP003
TP005
TP008
TP009
TP010
TP011
TP012
CN023
CN025
CN026
CN027
CN021
CN022
IF001
TU001
1-620-199-
LM-16 BOARD
M904
1-614-597-
CN010 (BLU)
LOAD M (−)
LOAD M (+)
WHT
RED
CN023(WHT)
CN022(RED)
CN030(BLK)
PG (X)
PG (Y)
(BLU)
PG COIL
CTL (X)
CTL (Y)
CTL HEAD
MOD (A)
GND
MOD (V)
UN SWD 5V
GND
SWD 9V
ATT
TEST SIGNAL
LOCAL
DX
ON
OFF
RF MODULATOR
CN001 (WHT)
N.C.
SWD 9V
GND
UN SWD 5V
MOD (V)
GND
MOD (A)
RF CHANNEL
IN
OUT
AERITAL
DR-38 BOARD
Q223
I
J
K
L
M

no mark : REC mode
( ) : PB mode
[ ] : FF mode
〈 〉 : CUE/REV mode
《(》 : REV mode
(( )) : REW mode
《 》 : LOADING mode
((( ))) : UNLOADING mode
Marked ✻ is not able to measure the voltage of it's position.

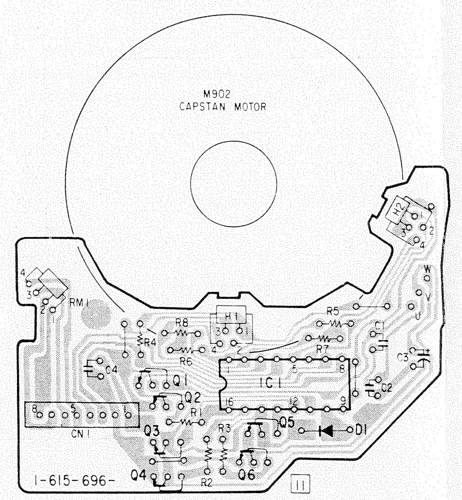
MI-5 BOARD


CN001
R002
PH001
R001
1-614-828-

MI-6 BOARD


CN002
R005
R004
PH002
1-614-829-

CAPSTAN MOTOR BOARD


M902
CAPSTAN MOTOR
IC1
Q1
Q2
Q3
Q4
Q5
Q6
D1
H1
CN1
1-615-696-

Note:

- All resistors are in ohms, 1/6W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF 50W\ or less are not indicated except for electrolytics. and tantalums
- All variable and adjustable resistors have characteristic curve B unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair.
- ━━ : B + bus.
- ━ ━ : B − bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal productio tolerances.

When indicating parts by reference number, please include the board name.

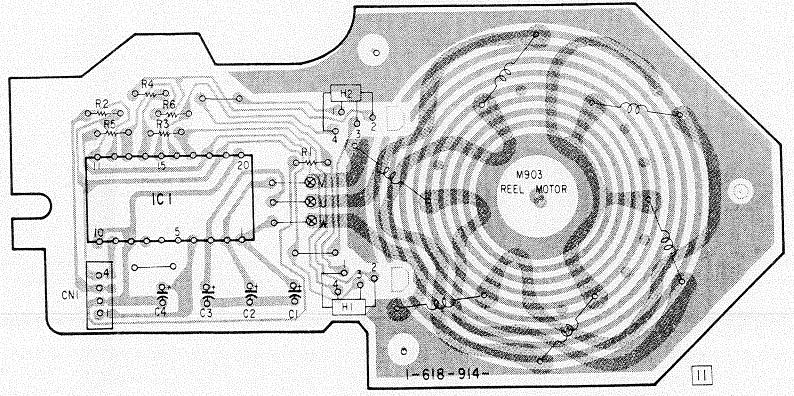
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

- **Signal path**
  ⇨ : REC Y/CHROMA Signal
  ➡ : REC AUDIO Signal

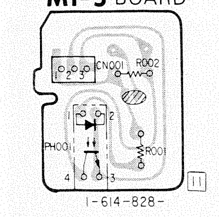
Signal path

	REC	REC/PB	PB
Drum speed servo		⇨	
Drum phase servo		⇨〉	
Drum servo (speed and phase)		⇨〉〉	
Capstan speed servo		⇨	
Capstan phase servo		⇨〉	
Capstan servo (speed and phase)		⇨〉〉	
Ref. signal	➡	⇨	▷

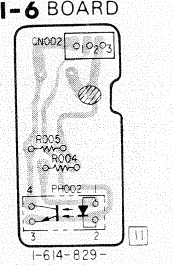
R STATOR (REEL MOTOR) BOARD


M903
REEL MOTOR
IC1
CN1
H1
H2
1-618-914-

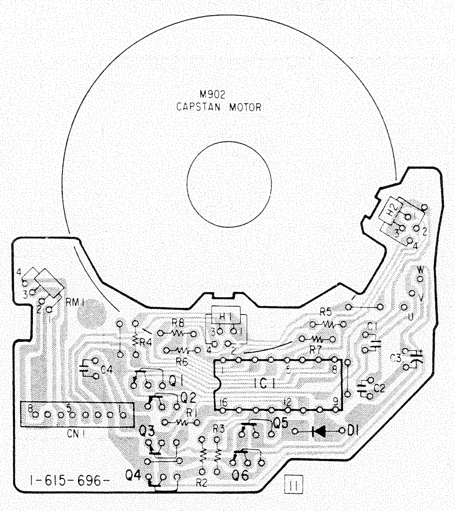
MI-5 BOARD


CN001
R002
PH001
R001
1-614-828-
11

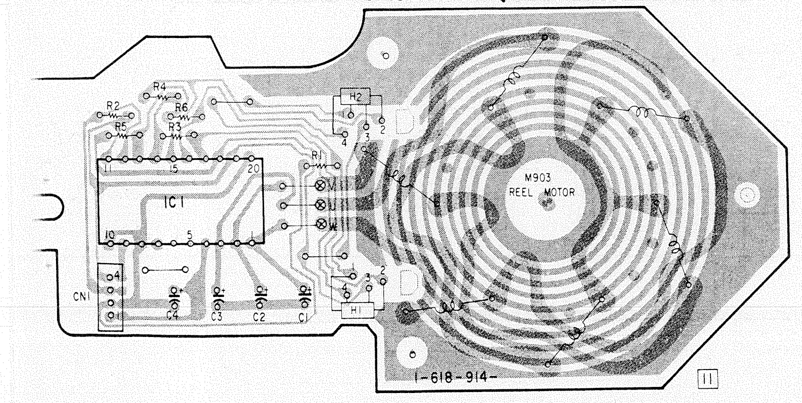
MI-6 BOARD


CN002
R005
R004
PH002
1-614-829-
11

CAPSTAN MOTOR BOARD


M902
CAPSTAN MOTOR
RM1
H1
H2
IC1
Q1
Q2
Q3
Q4
Q5
Q6
D1
CN1
1-615-696-
11

R STATOR (REEL MOTOR) BOARD


M903
REEL MOTOR
IC1
H1
H2
CN1
1-618-914-
11

Note:

- All resistors are in ohms, 1/6W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics. and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repair.
- ━━━ : B + bus.
- ━ ━ ━ : B − bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

When indicating parts by reference number, please include the board name.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

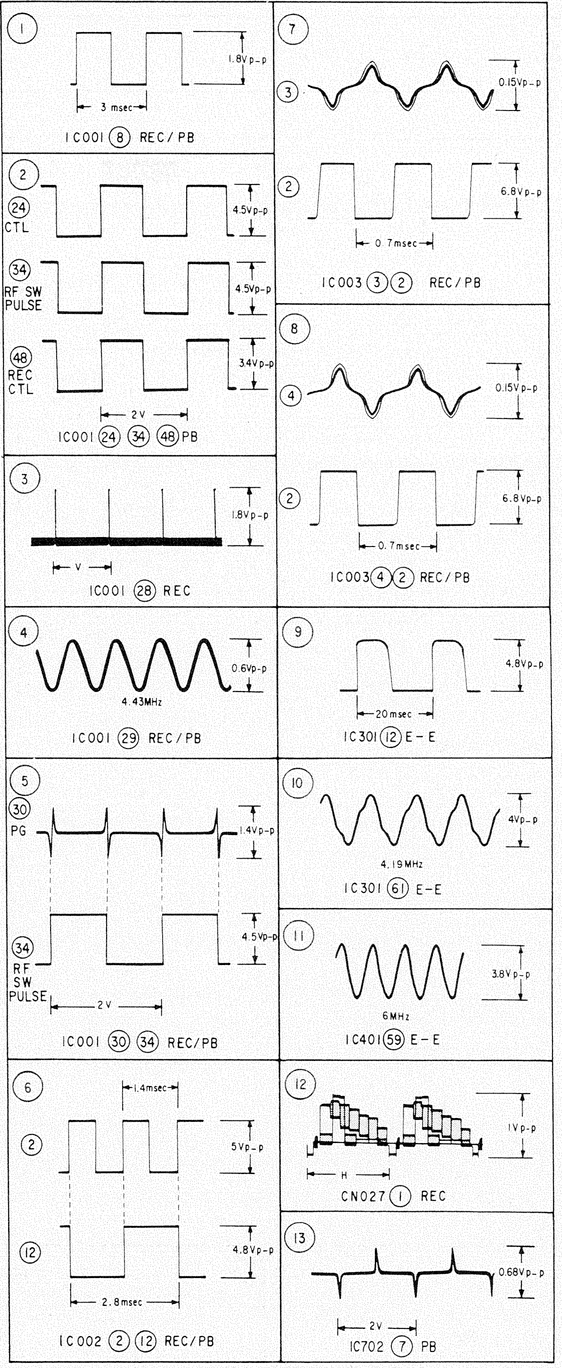
- **Signal path**

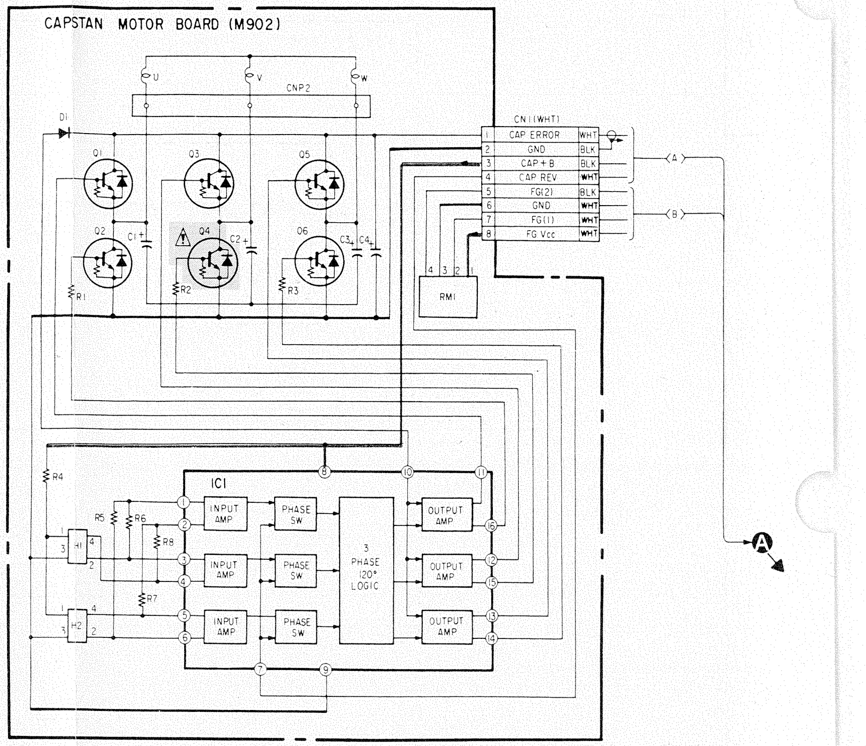
➢ : REC Y/CHROMA Signal
➤ : REC AUDIO Signal

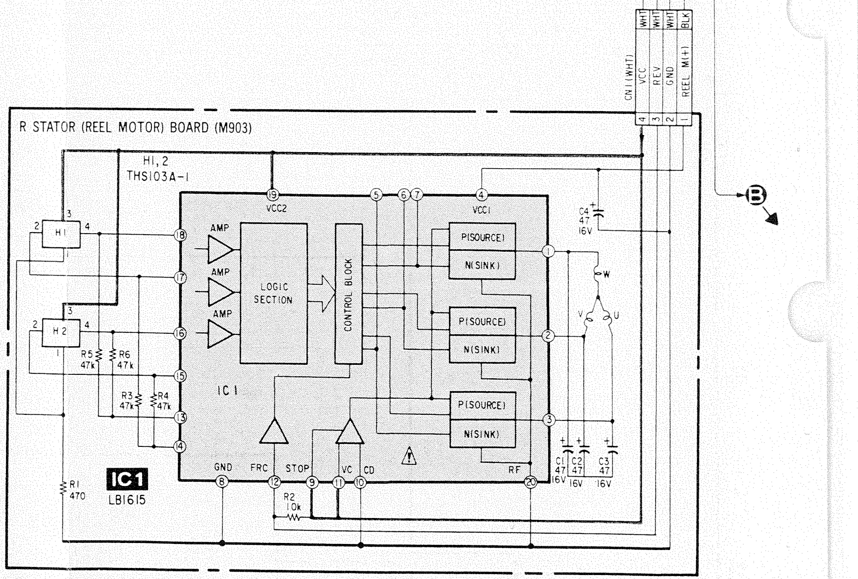
Signal path

	REC	REC/PB	PB
Drum speed servo		➢	
Drum phase servo		➢›	
Drum servo (speed and phase)		➢››	
Capstan speed servo		➢	
Capstan phase servo		➢›	
Capstan servo (speed and phase)		➢››	
Ref. signal	➤	➢	▷

ST-12 BOARD




CAPSTAN MOTOR BOARD (M902)
U
V
W
CNP2
D1
Q1
Q2
Q3
Q4
Q5
Q6
C1
C2
C3
C4
R1
R2
R3
R4
R5
R6
R7
R8
RM1
CN1 (WHT)
1 CAP ERROR WHT
2 GND BLK
3 CAP+B BLK
4 CAP REV WHT
5 FG(2) BLK
6 GND WHT
7 FG(1) WHT
8 FG Vcc WHT
A
B
IC1
INPUT AMP
PHASE SW
3 PHASE 120° LOGIC
OUTPUT AMP
H1
H2
Ⓐ

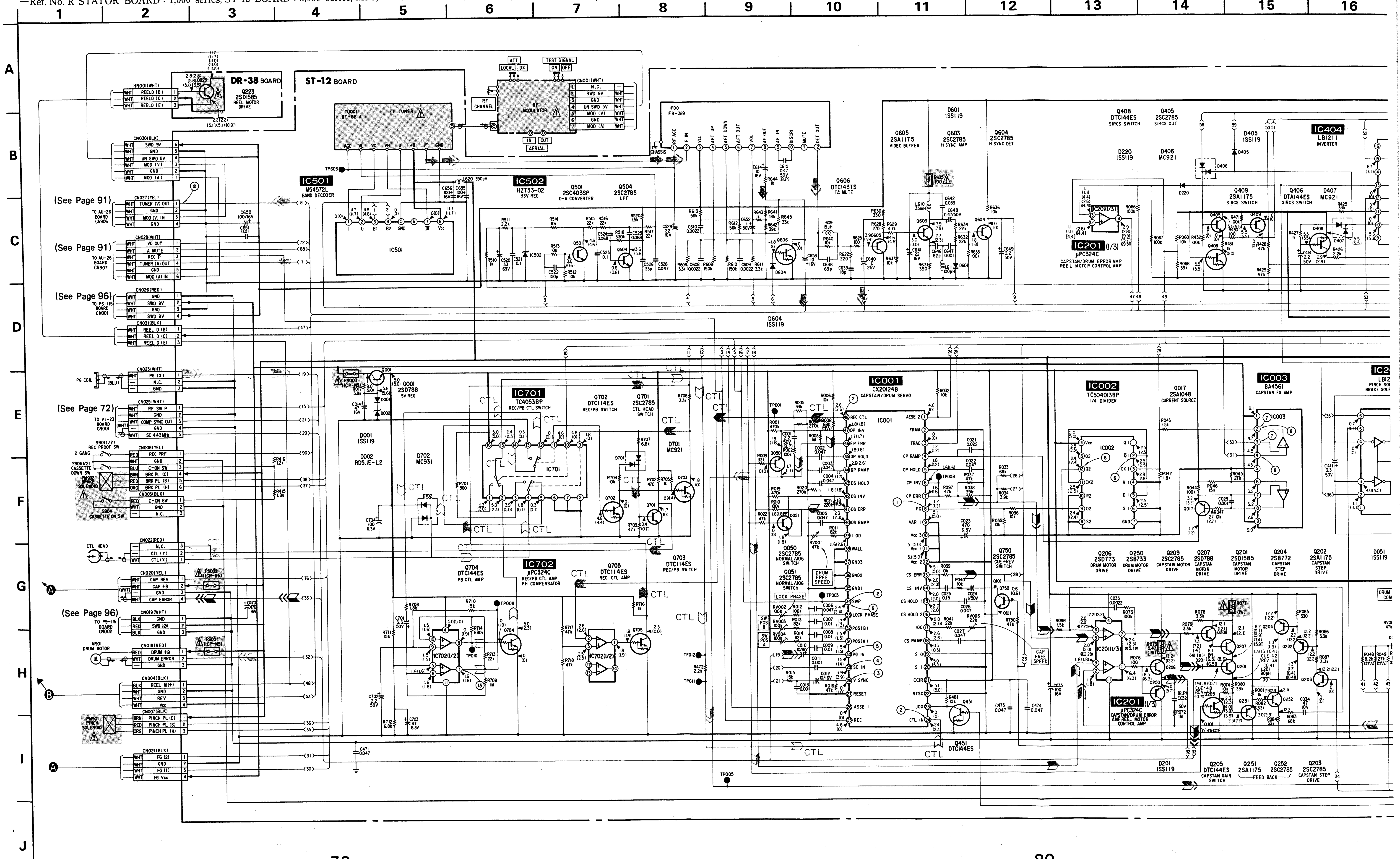

CN1 (WHT)
VCC WHT
REV WHT
GND WHT
REEL M(+) BLK
R STATOR (REEL MOTOR) BOARD (M903)
H1, 2
THS103A-1
H1
H2
VCC2
VCC1
AMP
LOGIC SECTION
CONTROL BLOCK
P(SOURCE)
N(SINK)
IC1
GND
FRC
STOP
VC
CD
RF
R1 470
R2 10k
R3 47k
R4 47k
R5 47k
R6 47k
C1 47 16V
C2 47 16V
C3 47 16V
C4 47 16V
U
V
W
IC1
LB1615
Ⓑ

SYSTEM CONTROL/SERVO, TUNER, TIMER

SYSTEM CONTROL/SERVO, TUNER, TIMER

ST-12 (SYSTEM CONTROL/SERVO, TUNER, TIMER) MI-5, MI-6 (ROTATION DETECTOR) DR-38 (REEL MOTOR DRIVE) LM-16 (LOADING/THREADING MOTOR) R STATOR (REEL MOTOR), CAPSTAN MOTOR SCHEMATIC DIAGRAM

—Ref. No. R STATOR BOARD : 1,000 series, ST-12 BOARD : 5,000 series, MI-5, MI-6, BOARDS : 7,000 series, DR-38 BOARD : 8,000 series—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A
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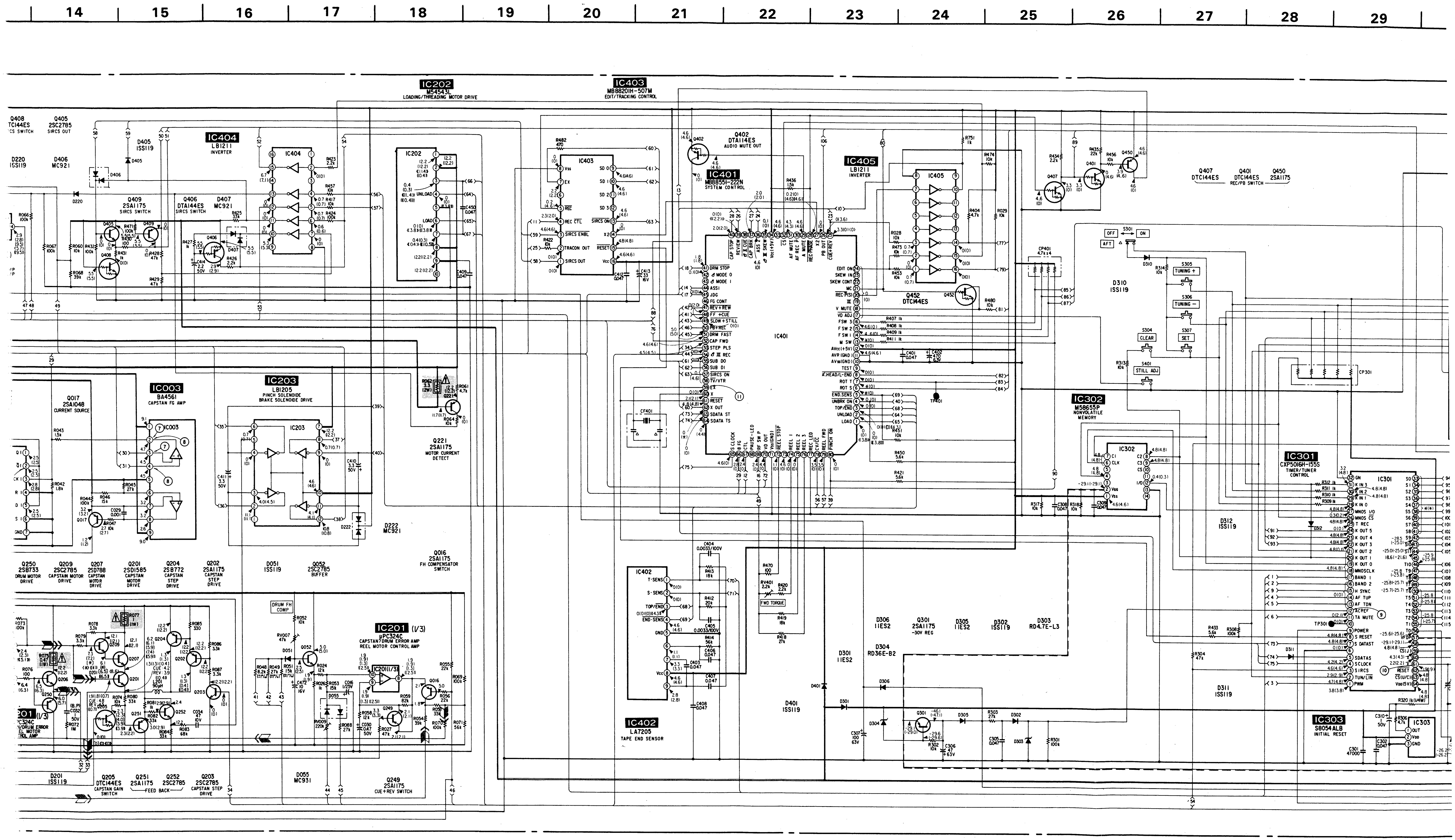
E
F
G
H
I
J
DR-38 BOARD
Q223 2SD1585 REEL MOTOR DRIVE
ST-12 BOARD
HN001(WHT)
REEL D (B)
REEL D (C)
REEL D (E)
CN030(BLK)
SWD 9V
GND
UN SWD 5V
MOD (V)
MOD (A)
CN027(YEL)
TUNER (V) OUT
MOD (V) IN
(See Page 91)
TO AU-26 BOARD CN906
CN028(WHT)
VD OUT
A MUTE
REC 'P'
TUNER (A) OUT
MOD (A) IN
TO AU-26 BOARD CN907
(See Page 96)
CN026(RED)
TO PS-115 BOARD CN001
CN031(BLK)
PG COIL
CN023(WHT)
PG (X)
N.C.
(See Page 72)
CN025(WHT)
RF SW P
COMP SYNC OUT
SC 4.43MHz
TO VI-23 BOARD CN001
S901(1/2) REC PROOF SW
2 GANG
S901(2/2) CASSETTE DOWN SW
CN008(YEL)
REC PRF
C-DN SW
BRK PL (C)
BRK PL (S)
BRK PL (H)
PM902 BRAKE SOLENOID
CN003(BLK)
S904 CASSETTE ON SW
CTL HEAD
CN022(RED)
CTL (Y)
CTL (X)
CN020(YEL)
CAP REV
CAP +B
CAP ERROR
PS002 (ICP-N5)
CN019(WHT)
SWD 12V
TO PS-115 BOARD CN002
PS001 (ICP-N5)
M901 DRUM MOTOR
CN018(RED)
DRUM +B
DRUM ERROR
CN004(BLK)
REEL M(+)
REV
Vcc
PM901 PINCH SOLENOID
CN007(BLK)
PINCH PL (C)
PINCH PL (S)
PINCH PL (H)
CN021(BLK)
FG (2)
FG (1)
FG Vcc
TU001 BT-881A
ET TUNER
RF CHANNEL
RF MODULATOR
ATT
LOCAL
DX
TEST SIGNAL
ON
OFF
IN
OUT
AERIAL
CN001(WHT)
N.C.
SWD 9V
UN SWD 5V
MOD (V)
MOD (A)
TP603
IC501 M54572L BAND DECODER
IC502 HZT33-02 33V REG
Q501 2SC403SP D-A CONVERTER
Q504 2SC2785 LPF
IF001 IFB-389
CHASSIS
RF AGC
IF IN
Vcc
AFT UP
AFT DOWN
AFT OUT
VOL
AF OUT
DISCRI
MUTE
DET OUT
Q605 2SA1175 VIDEO BUFFER
Q603 2SC2785 H SYNC AMP
Q604 2SC2785 H SYNC DET
D601 1SS119
Q606 DTC143TS TA MUTE
D604 1SS119
Q408 DTC144ES SIRCS SWITCH
Q405 2SC2785 SIRCS OUT
D405 1SS119
IC404 LB1211 INVERTER
D220 1SS119
D406 MC921
Q409 2SA1175 SIRCS SWITCH
Q406 DTA144ES SIRCS SWITCH
D407 MC921
IC201 (1/3) μPC324C CAPSTAN/DRUM ERROR AMP REEL MOTOR CONTROL AMP
Q001 2SD788 5V REG
PS003 (ICP-N15)
D001 1SS119
D002 RD5.1E-L2
D702 MC931
IC701 TC4053BP REC/PB CTL SWITCH
Q702 DTC114ES REC/PB SWITCH
Q701 2SC2785 CTL HEAD SWITCH
D701 MC921
Q703 DTC114ES REC/PB SWITCH
Q704 DTC144ES PB CTL AMP
IC702 μPC324C REC/PB CTL AMP FH COMPENSATOR
Q705 DTC114ES REC CTL AMP
CTL
TP009
TP010
TP012
TP011
TP005
IC001 CX20124B CAPSTAN/DRUM SERVO
REC CTL
DP INV
EP ERR
DP HOLD
DP RAMP
DS HOLD
DS INV
DS ERR
DS RAMP
1 OD
WALL
GND3
GND2
GND1
SWP
LOCK PHASE
POS(B)
POS(A)
PG IN
SC IN
V SYNC
RESET
ASSE I
REC
AESE 2
FRAM
TRAC
CP RAMP
CP HOLD
CP INV
CP ERR
FG
VAR
Vcc 3
Vcc 1
Vcc 2
CS ERR
CS INV
CS HOLD 1
CS HOLD 2
IOC
CS RAMP
S I
CCIR
NTSC
JOG
CTL IN
TP001
TP003
TP008
Q050 2SC2785 NORMAL/JOG SWITCH
Q051 2SC2785 NORMAL/JOG SWITCH
DRUM FREE SPEED
LOCK PHASE
SW POS A
SW POS B
Q451 DTC144ES
Q750 2SC2785 CUE+REV SWITCH
CAP FREE SPEED
IC002 TC4040I3BP 1/4 DIVIDER
Q017 2SA1048 CURRENT SOURCE
IC003 BA4561 CAPSTAN FG AMP
Q206 2SD773 DRUM MOTOR DRIVE
Q250 2SB733 DRUM MOTOR DRIVE
Q209 2SC2785 CAPSTAN MOTOR DRIVE
Q207 2SD788 CAPSTAN MOTOR DRIVE
Q201 2SD1585 CAPSTAN MOTOR DRIVE
Q204 2SB772 CAPSTAN STEP DRIVE
Q202 2SA1175 CAPSTAN STEP DRIVE
D051 1SS119
IC201 (1/3) μPC324C CAPSTAN/DRUM ERROR AMP REEL MOTOR CONTROL AMP
D201 1SS119
Q205 DTC144ES CAPSTAN GAIN SWITCH
Q251 2SA1175 FEED BACK
Q252 2SC2785 FEED BACK
Q203 2SC2785 CAPSTAN STEP DRIVE
LB12 PINCH SOL BRAKE SOLE
DRUM COM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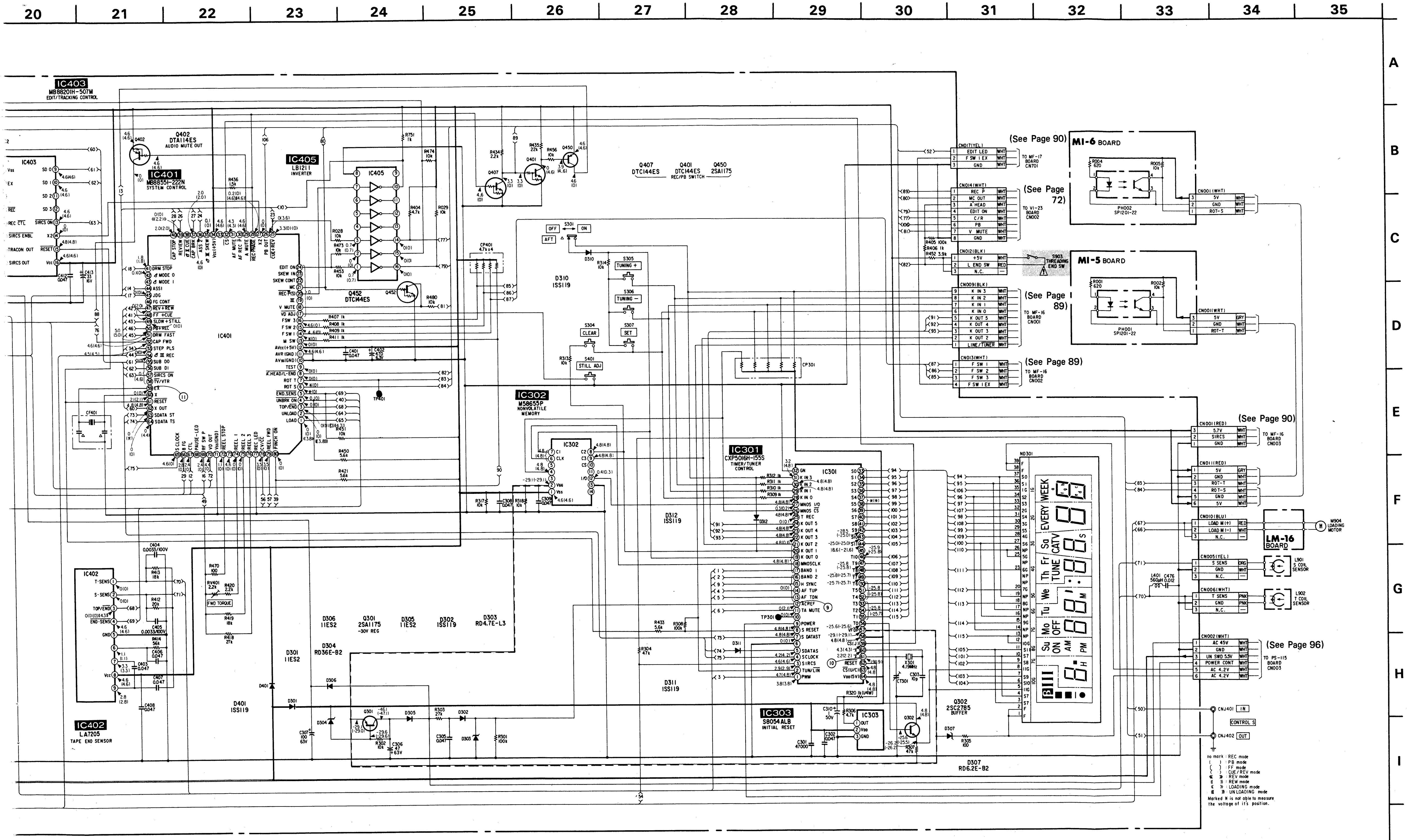
IC202
M54543L
LOADING/THREADING MOTOR DRIVE
IC403
MB88201H-507M
EDIT/TRACKING CONTROL
IC404
LB1211
INVERTER
Q408
DTC144ES
Q405
2SC2785
SIRCS OUT
D405
1SS119
D220
1SS119
D406
MC921
Q409
2SA1175
SIRCS SWITCH
Q406
DTA144ES
SIRCS SWITCH
D407
MC921
Q402
DTA114ES
AUDIO MUTE OUT
IC401
MB88551-222N
SYSTEM CONTROL
IC405
LB1211
INVERTER
Q452
DTC144ES
Q407
DTC144ES
Q401
DTC144ES
REC/PB SWITCH
Q450
2SA1175
S301
OFF
ON
AFT
S305
TUNING +
S306
TUNING −
S304
CLEAR
S307
SET
S401
STILL ADJ
D310
1SS119
CP401
CP301
IC003
BA4561
CAPSTAN FG AMP
Q017
2SA1048
CURRENT SOURCE
IC203
LB1205
PINCH SOLENOIDE
BRAKE SOLENOIDE DRIVE
Q221
2SA1175
MOTOR CURRENT DETECT
D222
MC921
CF401
TP401
IC302
M58655P
NONVOLATILE MEMORY
IC301
CXP5016H-155S
TIMER/TUNER CONTROL
D312
1SS119
Q250
2SB733
DRUM MOTOR DRIVE
Q209
2SC2785
CAPSTAN MOTOR DRIVE
Q207
2SD788
CAPSTAN MOTOR DRIVE
Q201
2SD1585
CAPSTAN MOTOR DRIVE
Q204
2SB772
CAPSTAN STEP DRIVE
Q202
2SA1175
CAPSTAN STEP DRIVE
D051
1SS119
Q052
2SC2785
BUFFER
Q016
2SA1175
FH COMPENSATOR SWITCH
DRUM FH COMP
IC201 (1/3)
μPC324C
CAPSTAN/DRUM ERROR AMP
REEL MOTOR CONTROL AMP
IC402
LA7205
TAPE END SENSOR
FWD TORQUE
D306
11ES2
Q301
2SA1175
-30V REG
D305
11ES2
D302
1SS119
D303
RD4.7E-L3
D304
RD36E-B2
D301
11ES2
D401
1SS119
D311
1SS119
TP301
IC303
S8054ALB
INITIAL RESET
D201
1SS119
Q205
DTC144ES
CAPSTAN GAIN SWITCH
Q251
2SA1175
Q252
2SC2785
FEED BACK
Q203
2SC2785
CAPSTAN STEP DRIVE
D055
MC931
Q249
2SA1175
CUE+REV SWITCH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I
J
IC403
MB88201H-507M
EDIT/TRACKING CONTROL
Q402
DTA114ES
AUDIO MUTE OUT
IC401
MB88551-222N
SYSTEM CONTROL
IC405
LB1211
INVERTER
Q452
DTC144ES
Q407
DTC144ES
Q401
DTC144ES
REC/PB SWITCH
Q450
2SA1175
IC302
M58655P
NONVOLATILE MEMORY
IC301
CXP5016H-155S
TIMER/TUNER CONTROL
IC303
S8054ALB
INITIAL RESET
Q302
2SC2785
BUFFER
IC402
LA7205
TAPE END SENSOR
D306
11ES2
Q301
2SA1175
-30V REG
D305
11ES2
D302
1SS119
D303
RD4.7E-L3
D304
RD36E-B2
D301
11ES2
D401
1SS119
D310
1SS119
D312
1SS119
D311
1SS119
D307
RD6.2E-B2
S301
OFF
ON
AFT
S305
TUNING +
S306
TUNING −
S304
CLEAR
S307
SET
S401
STILL ADJ
S903
THREADING END SW
ND301
EVERY
WEEK
CATV
TUNE
Sa
Fr
Th
We
Tu
Mo
Su
OFF
ON
AM
PM
(See Page 90)
MI-6 BOARD
PH002
SP1201-22
(See Page 72)
MI-5 BOARD
PH001
SP1201-22
(See Page 89)
(See Page 89)
(See Page 90)
(See Page 96)
CN017(YEL)
EDIT LED
F SW 1 EX
GND
TO MF-17 BOARD CN701
CN014(WHT)
REC P
MC OUT
A HEAD
EDIT ON
C/R
PB
V MUTE
GND
TO VI-23 BOARD CN002
CN012(BLK)
+5V
L END SW
N.C.
CN009(BLK)
K IN 3
K IN 2
K IN 1
K IN 0
K OUT 5
K OUT 4
K OUT 3
K OUT 2
LINE/TUNER
TO MF-16 BOARD CN001
CN013(WHT)
F SW 1
F SW 2
F SW 3
F SW 1 EX
TO MF-16 BOARD CN002
CN001(WHT)
5V
GND
ROT-S
CN001(WRT)
5V
GND
ROT-T
CN001(RED)
5.7V
SIRCS
GND
TO MF-16 BOARD CN003
CN011(RED)
5V
GND
ROT-T
ROT-S
GND
5V
CN010(BLU)
LOAD M(+)
LOAD M(−)
N.C.
M904
LOADING MOTOR
LM-16 BOARD
CN005(YEL)
S SENS
GND
N.C.
L901
S COIL SENSOR
CN006(WHT)
T SENS
GND
N.C.
L902
T COIL SENSOR
CN002(WHT)
AC 45V
GND
UN SWD 5.5V
POWER CONT
AC 4.2V
AC 4.2V
TO PS-115 BOARD CN003
CNJ401
IN
CONTROL S
CNJ402
OUT
TP401
TP301
X301
4.19MHz
CF401

no mark : REC mode
( ) : PB mode
{ } : FF mode
〈 〉 : CUE/REV mode
《 》 : REV mode
(( )) : REW mode
« » : LOADING mode
((( ))) : UNLOADING mode

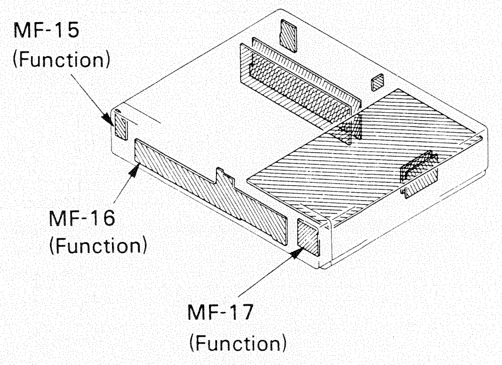
Marked ✱ is not able to measure the voltage of it's position.

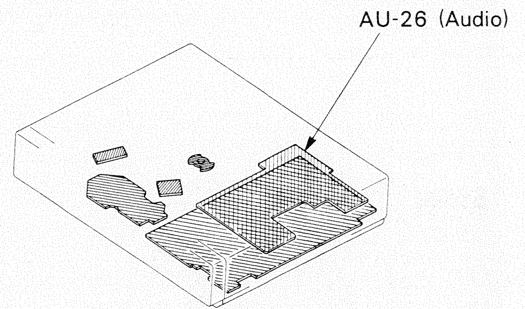
AU-26 (AUDIO), MF-15, MF-16, MF-17 (FUNCTION SWITCH, LED) PRINTED WIRING BOARDS

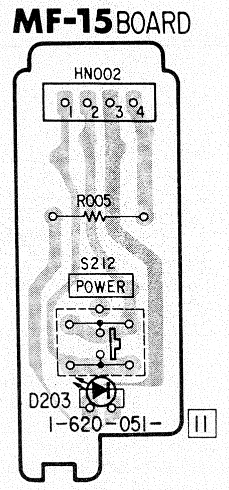
—Ref. No. AU-26 BOARD : 4,000 series, MF-15, MF-16, MF-17 BOARDS : 8,000 series—

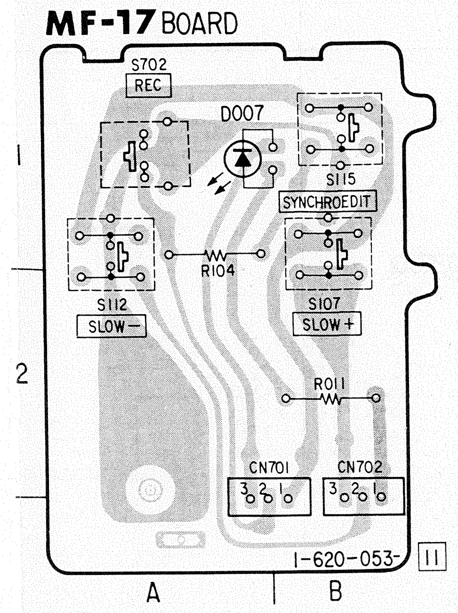
Note:

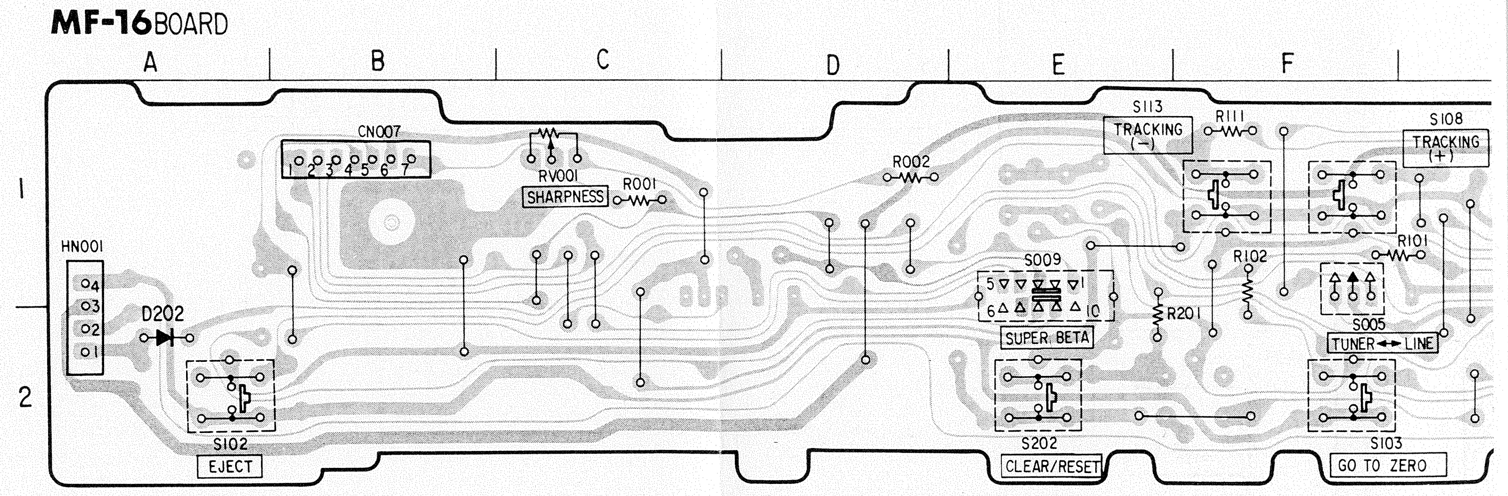
- ○— : indicates a lead wire mounted on the component side.
- ▨ : Pattern from the side which enables seeing.
- ▨ : B+ pattern from the side which enables seeing.


MF-15
(Function)
MF-16
(Function)
MF-17
(Function)

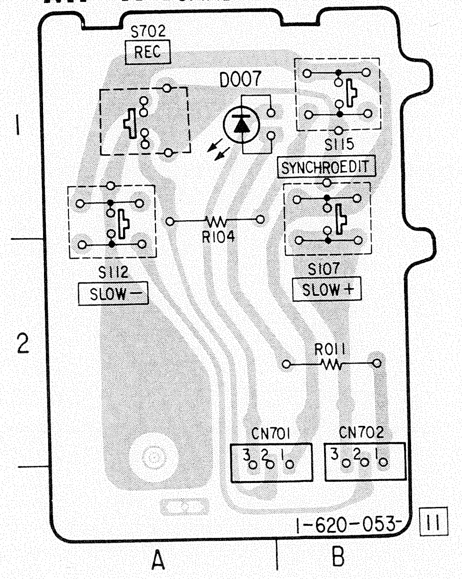


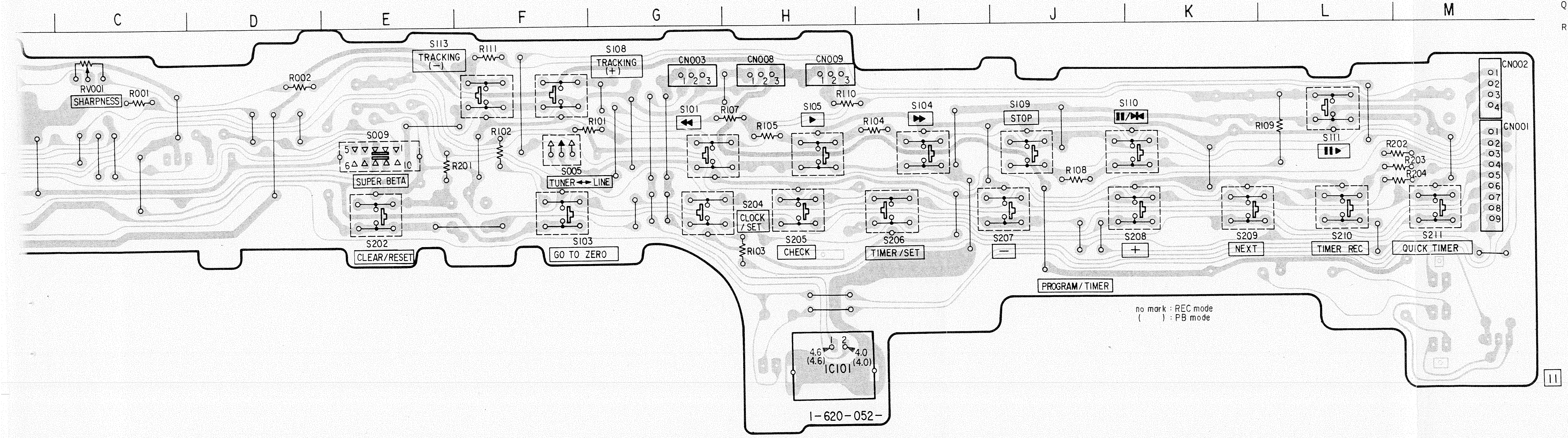

MF-15 BOARD
HN002
1 2 3 4
R005
S212
POWER
D203
1-620-051-
11


MF-17 BOARD
S702
REC
D007
S115
SYNCHROEDIT
R104
S112
SLOW−
S107
SLOW+
R011
CN701
3 2 1
CN702
3 2 1
1-620-053-
11
1
2
A
B


MF-16 BOARD
A
B
C
D
E
F
1
2
HN001
4
3
2
1
D202
CN007
1 2 3 4 5 6 7
RV001
SHARPNESS
R001
R002
S113
TRACKING
(−)
R111
S108
TRACKING
(+)
R101
R102
S009
5
6
10
SUPER BETA
R201
S005
TUNER ◄► LINE
S102
EJECT
S202
CLEAR/RESET
S103
GO TO ZERO

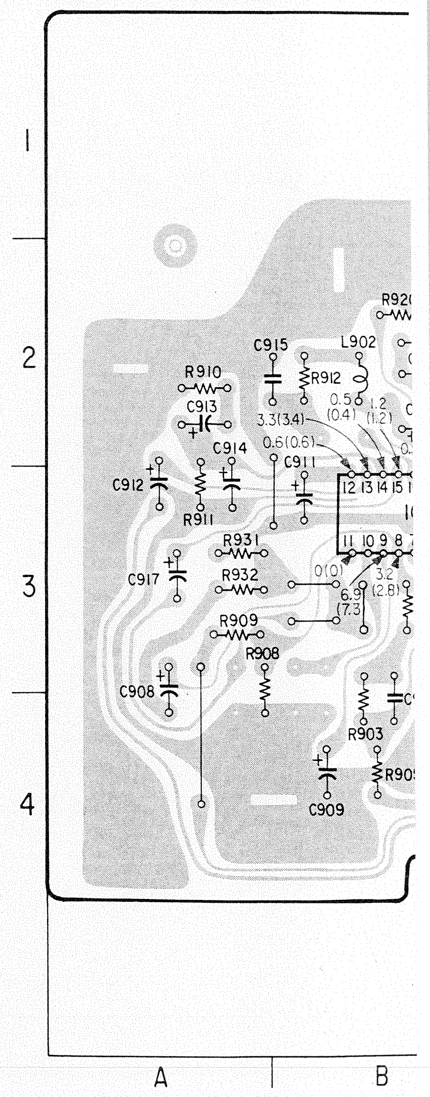
MF-17 BOARD

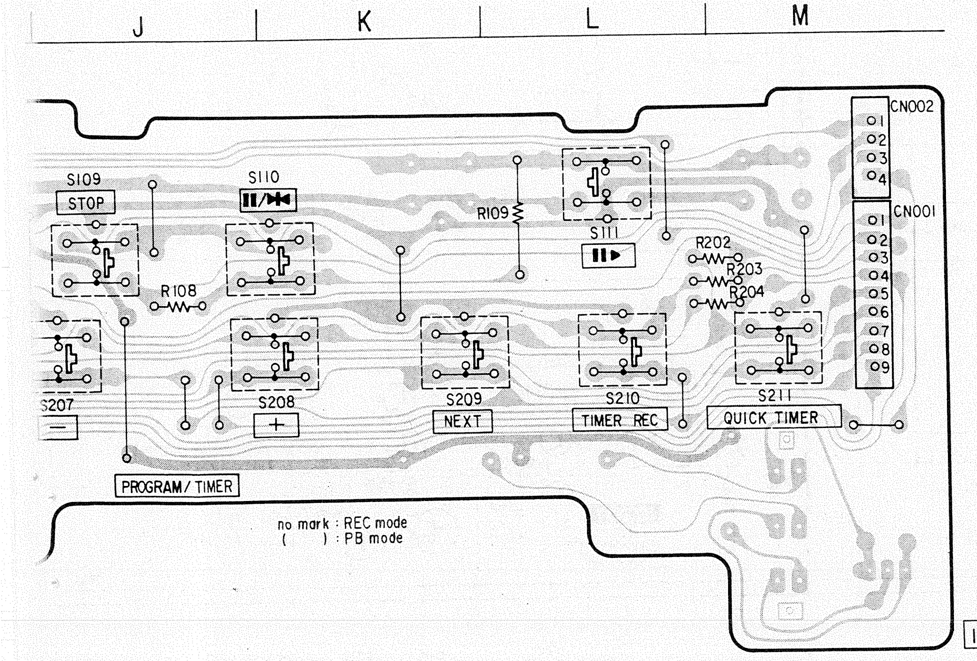

S702
REC
D007
S115
SYNCHROEDIT
S112
SLOW−
R104
S107
SLOW+
R011
CN701
CN702
1-620-053-
11
1
2
A
B


C
D
E
F
G
H
I
J
K
L
M
RV001
SHARPNESS
R001
R002
S113
TRACKING (−)
R111
S108
TRACKING (+)
CN003
CN008
CN009
CN002
CN001
S009
SUPER BETA
R201
R102
S005
TUNER ◄► LINE
R101
S101
R107
R105
S105
R110
R104
S104
S109
STOP
S110
R109
S111
R202
R203
R204
S202
CLEAR/RESET
S103
GO TO ZERO
S204
CLOCK /SET
R103
S205
CHECK
S206
TIMER/SET
S207
−
R108
S208
+
S209
NEXT
S210
TIMER REC
S211
QUICK TIMER
PROGRAM/TIMER
no mark : REC mode
( ) : PB mode
IC101
4.6 (4.6)
4.0 (4.0)
1-620-052-
11

D001	E-2
D002	F-1
D003	F-4
D004	F-4
D005	F-2
D901	C-3
IC001	F-3
IC002	F-3
IC901	D-4
IC902	B-3
Q001	E-1
Q002	E-1
Q003	E-2
Q004	E-2
Q005	F-1
Q006	F-1
Q008	F-4
Q010	F-3
Q902	C-2
Q904	D-2
Q906	D-2
RV902	D-2

AU-26 BOARD

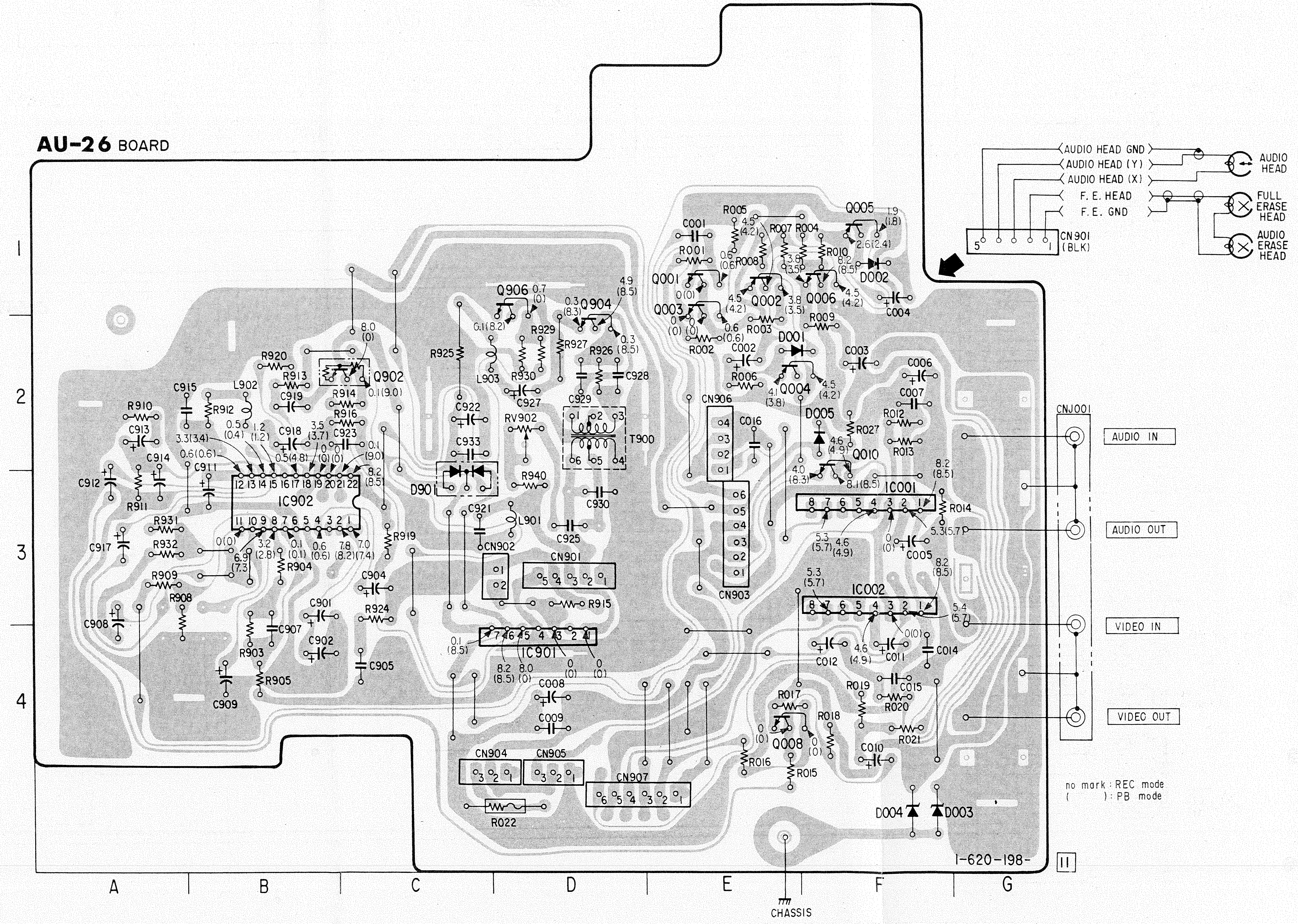

1
2
3
4
A
B
R910
C913
C915
R912
L902
C914
C911
C912
R911
R931
R932
C917
R909
R908
C908
R903
C909


J
K
L
M
S109
STOP
S110
S111
R108
R109
R202
R203
R204
S207
S208
S209
NEXT
S210
TIMER REC
S211
QUICK TIMER
PROGRAM/TIMER
CN002
CN001

no mark : REC mode
( ) : PB mode

D001	E-2
D002	F-1
D003	F-4
D004	F-4
D005	F-2
D901	C-3
IC001	F-3
IC002	F-3
IC901	D-4
IC902	B-3
Q001	E-1
Q002	E-1
Q003	E-2
Q004	E-2
Q005	F-1
Q006	F-1
Q008	F-4
Q010	F-3
Q902	C-2
Q904	D-2
Q906	D-2
RV902	D-2

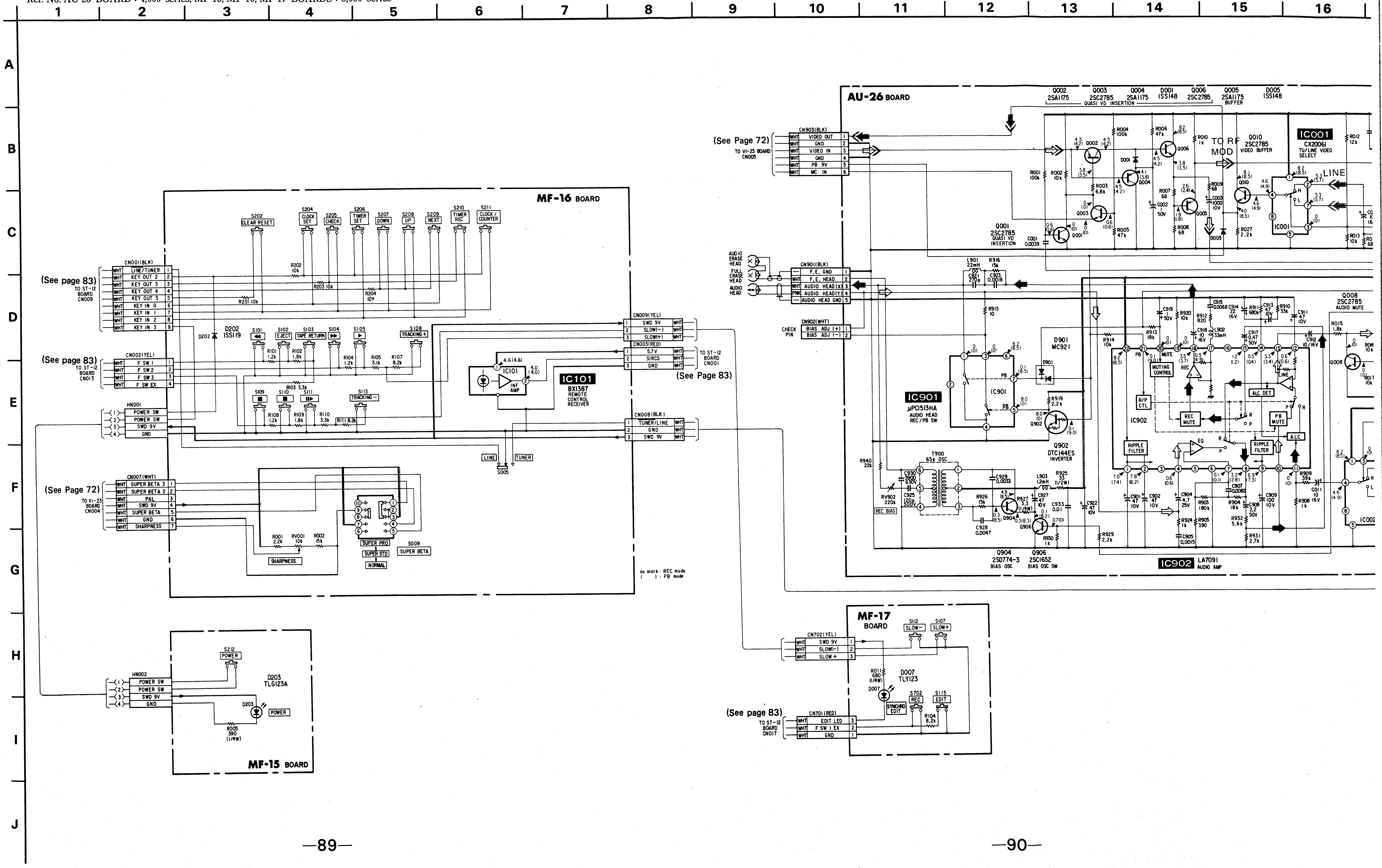
AU-26 BOARD

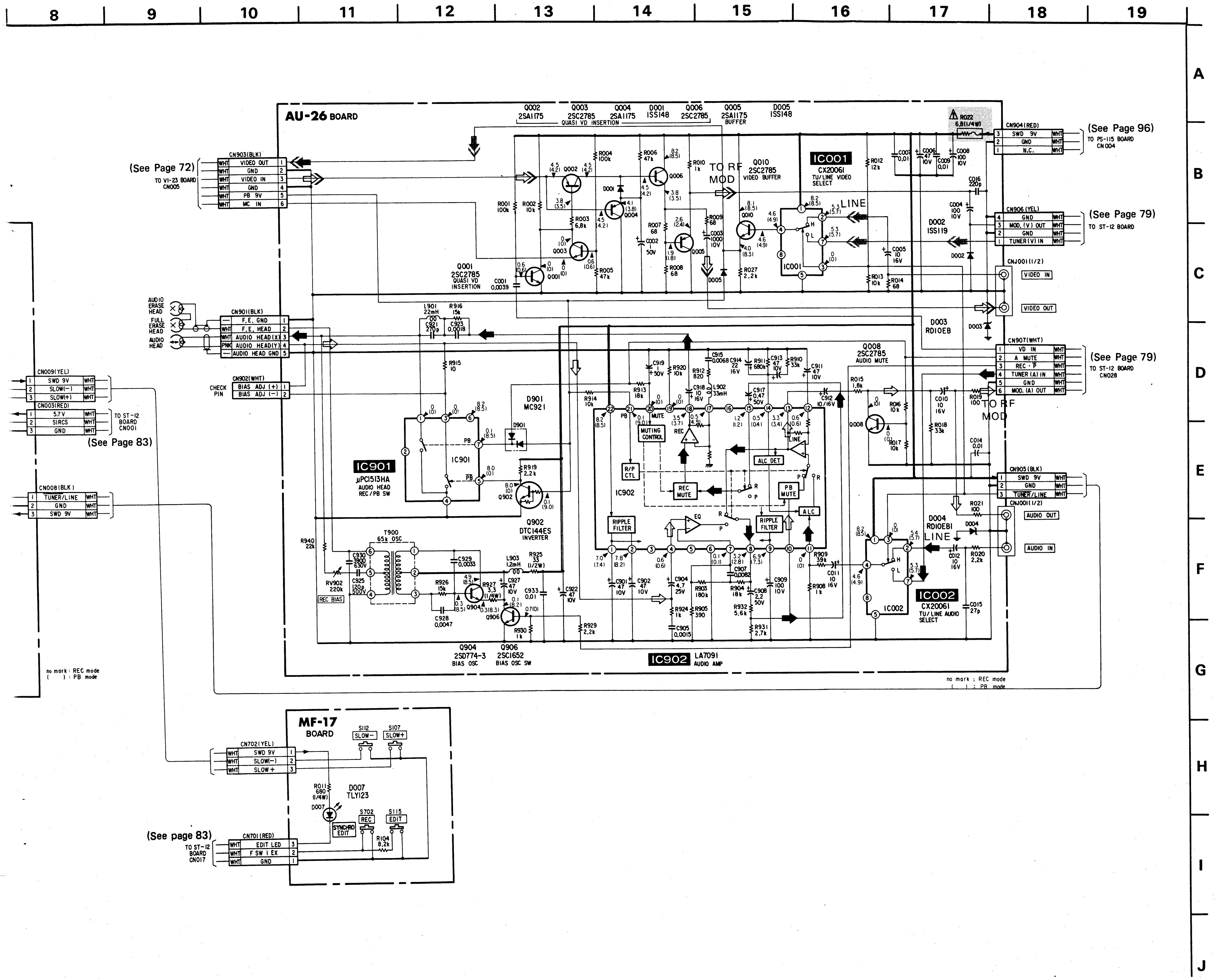

1
2
3
4
A
B
C
D
E
F
G
IC902
IC901
IC001
IC002
Q902
Q904
Q906
Q001
Q002
Q003
Q004
Q005
Q006
Q008
Q010
D001
D002
D003
D004
D005
D901
T900
RV902
CN901
CN902
CN903
CN904
CN905
CN906
CN907
CNJ001
AUDIO IN
AUDIO OUT
VIDEO IN
VIDEO OUT
CN901 (BLK)
AUDIO HEAD GND
AUDIO HEAD (Y)
AUDIO HEAD (X)
F.E. HEAD
F.E. GND
AUDIO HEAD
FULL ERASE HEAD
AUDIO ERASE HEAD
CHASSIS
1-620-198-

no mark : REC mode
( ) : PB mode

AU-26 (AUDIO), MF-15, MF-16, MF-17 (FUNCTION SWITCH, LED) SCHEMATIC DIAGRAM

—Ref. No. AU-26 BOARD : 4,000 series, MF-15, MF-16, MF-17 BOARDS : 8,000 series—


MF-16 BOARD
MF-15 BOARD
MF-17 BOARD
AU-26 BOARD
IC101 BX1387 REMOTE CONTROL RECEIVER
IC901 μPC1513HA AUDIO HEAD REC/PB SW
IC902 LA7091 AUDIO AMP
IC001 CX20061 TU/LINE VIDEO SELECT
Q001 2SC2785 QUASI VD INSERTION
Q002 2SA1175
Q003 2SC2785
Q004 2SA1175
Q006 2SC2785
Q005 2SA1175 BUFFER
Q010 2SC2785 VIDEO BUFFER
Q008 2SC2785 AUDIO MUTE
Q902 DTC144ES INVERTER
Q904 2SD774-3 BIAS OSC
Q906 2SC1652 BIAS OSC SW
D901 MC921
D202 1SS119
D203 TLG123A
D007 TLY123
T900 65k OSC
TO RF MOD
LINE
S202 CLEAR RESET
S204 CLOCK SET
S205 CHECK
S206 TIMER SET
S207 DOWN
S208 UP
S209 NEXT
S210 TIMER REC
S211 CLOCK/COUNTER
S101
S102 EJECT
S103 TAPE RETURN
S104
S105
S108 TRACKING +
S109
S110
S111
S113 TRACKING −
S005 LINE TUNER
S009 SUPER BETA
SUPER PRO
SUPER STD
NORMAL
SHARPNESS
S212 POWER
S112 SLOW−
S107 SLOW+
S702 REC
S115 EDIT
SYNCHRO EDIT
CN001(BLK) LINE/TUNER KEY OUT 2 KEY OUT 3 KEY OUT 4 KEY OUT 5 KEY IN 0 KEY IN 1 KEY IN 2 KEY IN 3
CN002(YEL) F SW 1 F SW 2 F SW 3 F SW EX
HN001 POWER SW POWER SW SWD 9V GND
CN007(WHT) SUPER BETA 3 SUPER BETA 2 PAL SWD 9V SUPER BETA GND SHARPNESS
CN009(YEL) SWD 9V SLOW(−) SLOW(+)
CN003(RED) 5.7V SIRCS GND
CN008(BLK) TUNER/LINE GND SWD 9V
HN002 POWER SW POWER SW SWD 9V GND
CN702(YEL) SWD 9V SLOW(−) SLOW+
CN701(RED) EDIT LED F SW 1 EX GND
CN903(BLK) VIDEO OUT GND VIDEO IN GND PB 9V MC IN
CN901(BLK) F.E. GND F.E. HEAD AUDIO HEAD(X) AUDIO HEAD(Y) AUDIO HEAD GND
CN902(WHT) BIAS ADJ (+) BIAS ADJ (−)
AUDIO ERASE HEAD
FULL ERASE HEAD
AUDIO HEAD
CHECK PIN
REC BIAS
MUTING CONTROL
R/P CTL
REC MUTE
PB MUTE
ALC DET
ALC
RIPPLE FILTER
EQ
(See page 83) TO ST-12 BOARD CN009
(See page 83) TO ST-12 BOARD CN013
(See Page 72) TO VI-23 BOARD CN004
(See Page 72) TO VI-23 BOARD CN005
(See Page 83) TO ST-12 BOARD CN001
(See page 83) TO ST-12 BOARD CN017
no mark : REC mode
( ) : PB mode


8
9
10
11
12
13
14
15
16
17
18
19
A
B
C
D
E
F
G
H
I
J
AU-26 BOARD
Q002 2SA1175
Q003 2SC2785
Q004 2SA1175
QUASI VD INSERTION
D001 1SS148
Q006 2SC2785
Q005 2SA1175 BUFFER
D005 1SS148
R022 6.8 (1/4W)
CN904 (RED)
SWD 9V
GND
N.C.
(See Page 96)
TO PS-115 BOARD CN004
CN903 (BLK)
VIDEO OUT
GND
VIDEO IN
GND
PB 9V
MC IN
(See Page 72)
TO VI-23 BOARD CN005
TO RF MOD
Q010 2SC2785 VIDEO BUFFER
IC001
CX20061
TU/LINE VIDEO SELECT
LINE
CN906 (YEL)
GND
MOD. (V) OUT
GND
TUNER (V) IN
(See Page 79)
TO ST-12 BOARD
D002 1SS119
CNJ001 (1/2)
VIDEO IN
VIDEO OUT
Q001 2SC2785 QUASI VD INSERTION
AUDIO ERASE HEAD
FULL ERASE HEAD
AUDIO HEAD
CN901 (BLK)
F.E. GND
F.E. HEAD
AUDIO HEAD (X)
AUDIO HEAD (Y)
AUDIO HEAD GND
CHECK PIN
CN902 (WHT)
BIAS ADJ (+)
BIAS ADJ (−)
D003 RD10EB
Q008 2SC2785 AUDIO MUTE
CN907 (WHT)
VD IN
A MUTE
REC · P̄
TUNER (A) IN
GND
MOD. (A) OUT
(See Page 79)
TO ST-12 BOARD CN028
CN009 (YEL)
SWD 9V
SLOW (−)
SLOW (+)
CN003 (RED)
5.7V
SIRCS
GND
TO ST-12 BOARD CN001
(See Page 83)
D901 MC921
IC901
μPC1513HA
AUDIO HEAD REC/PB SW
Q902 DTC144ES INVERTER
MUTING CONTROL
R/P CTL
IC902
REC MUTE
ALC DET
PB MUTE
ALC
RIPPLE FILTER
EQ
CN905 (BLK)
SWD 9V
GND
TUNER/LINE
CNJ001 (1/2)
AUDIO OUT
AUDIO IN
D004 RD10EB1
LINE
IC002
CX20061
TU/LINE AUDIO SELECT
CN008 (BLK)
TUNER/LINE
GND
SWD 9V
T900 65k OSC
REC BIAS
Q904 2SD774-3 BIAS OSC
Q906 2SC1652 BIAS OSC SW
IC902 LA7091 AUDIO AMP
no mark : REC mode
( ) : PB mode
MF-17 BOARD
S112 SLOW−
S107 SLOW+
CN702 (YEL)
SWD 9V
SLOW (−)
SLOW +
D007 TLY123
S702 REC
S115 EDIT
SYNCHRO EDIT
(See page 83)
TO ST-12 BOARD CN017
CN701 (RED)
EDIT LED
F SW I EX
GND

Note:

- All resistors are in ohms, 1/6W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics. and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ━ : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

When indicating parts by reference number, please include the board name.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

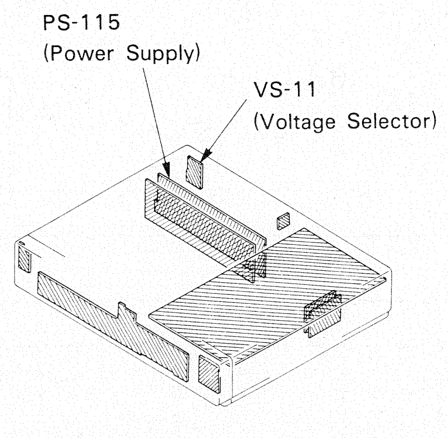
- **Signal path**
  - ➡ : REC Y/CHROMA Signal
  - ⇨ : PB Y/CHROMA Signal
  - ➡ : REC AUDIO Signal
  - ⇨ : PB AUDIO Signal

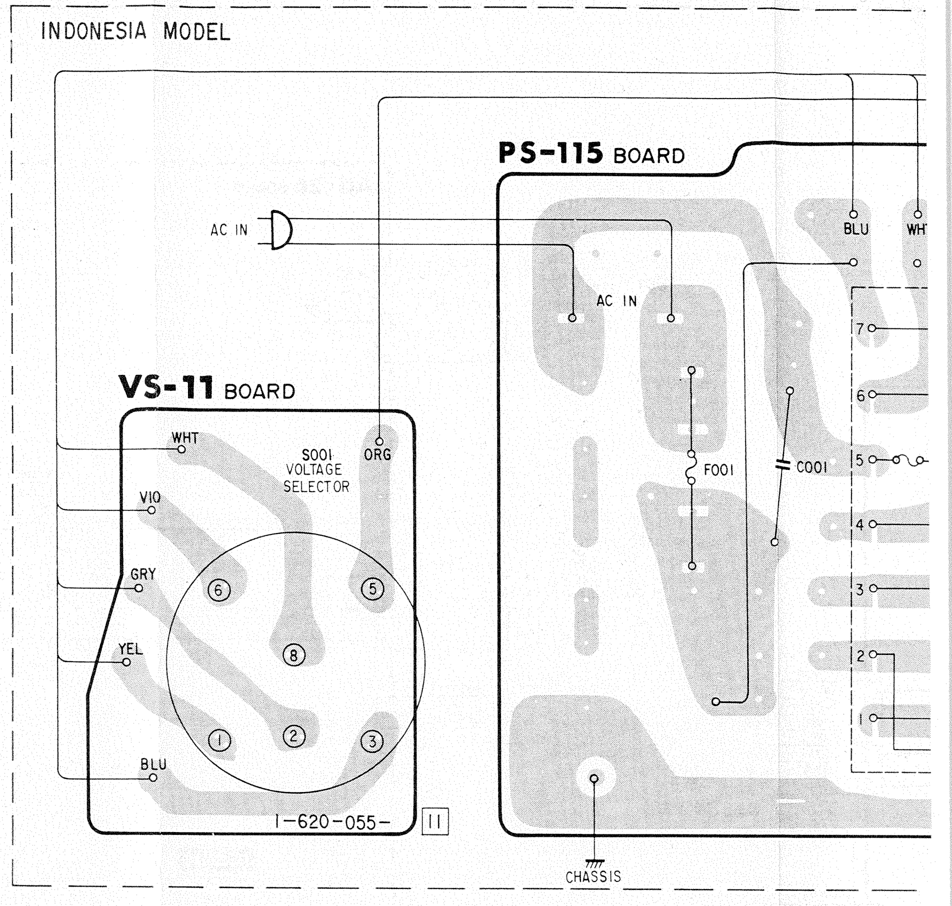
PS-115 (POWER SUPPLY), VS-11 (VOLTAGE SELECTOR) PRINTED WIRING BOARDS

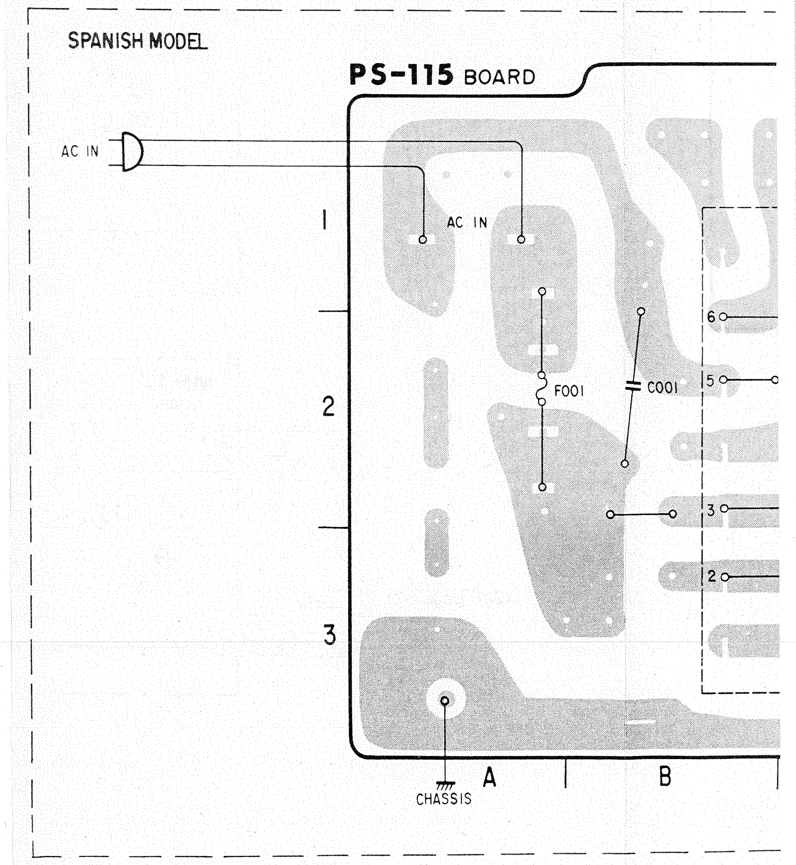
—Ref. No. PS-115, VS-11 BOARDS : 6,000 series—

Note:

- ● ○— : indicates a lead wire mounted on the component side.
- ● ▨ : soldering side.
- ● ▨ : B+ Pattern.


PS-115
(Power Supply)
VS-11
(Voltage Selector)


INDONESIA MODEL
PS-115 BOARD
VS-11 BOARD
AC IN
AC IN
BLU
WHT
WHT
ORG
S001
VOLTAGE
SELECTOR
VIO
GRY
YEL
BLU
6
5
8
1
2
3
1-620-055-
11
F001
C001
7
6
5
4
3
2
1
CHASSIS

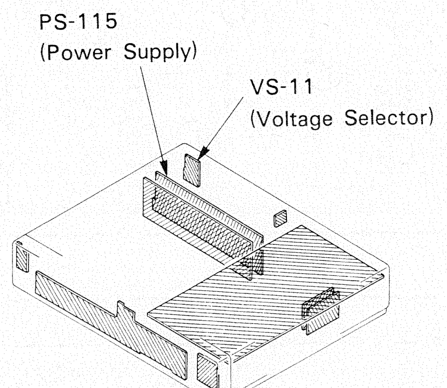

SPANISH MODEL
PS-115 BOARD
AC IN
AC IN
1
2
3
F001
C001
6
5
3
2
CHASSIS
A
B

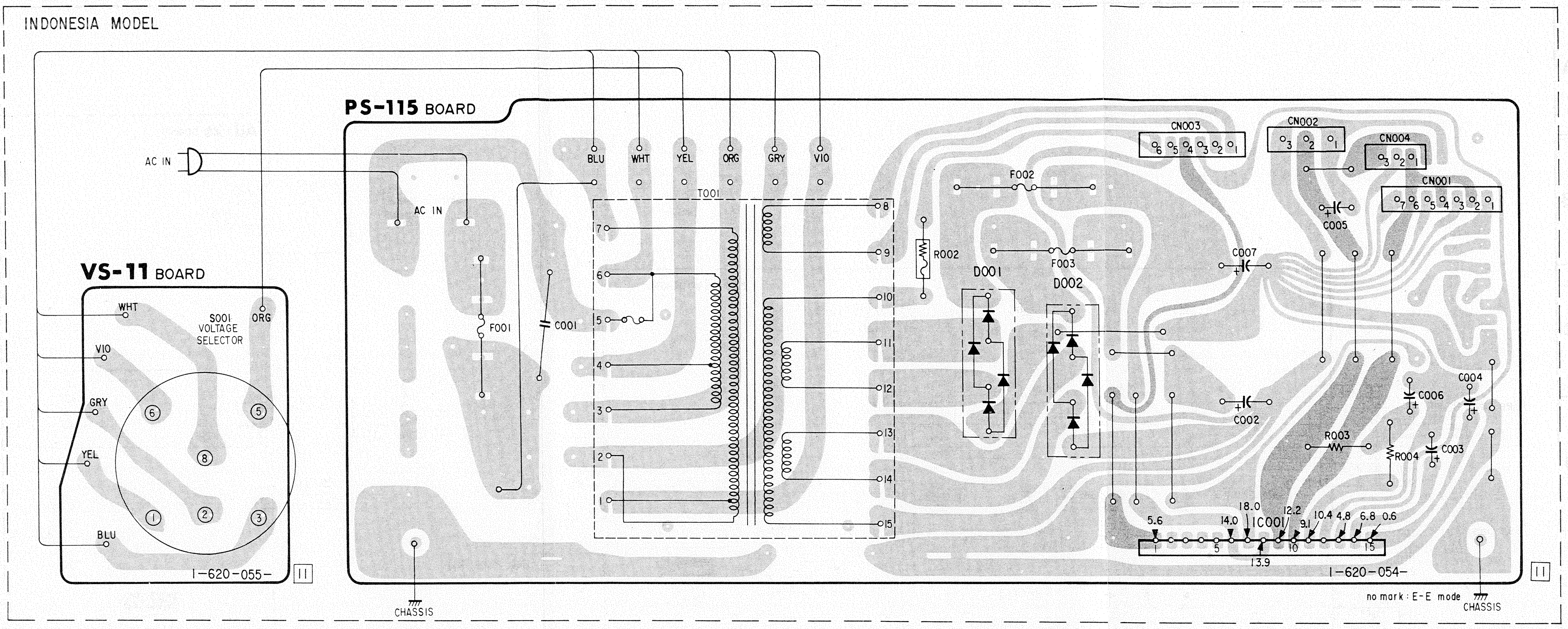
PS-115 (POWER SUPPLY), VS-11 (VOLTAGE SELECTOR) PRINTED WIRING BOARDS

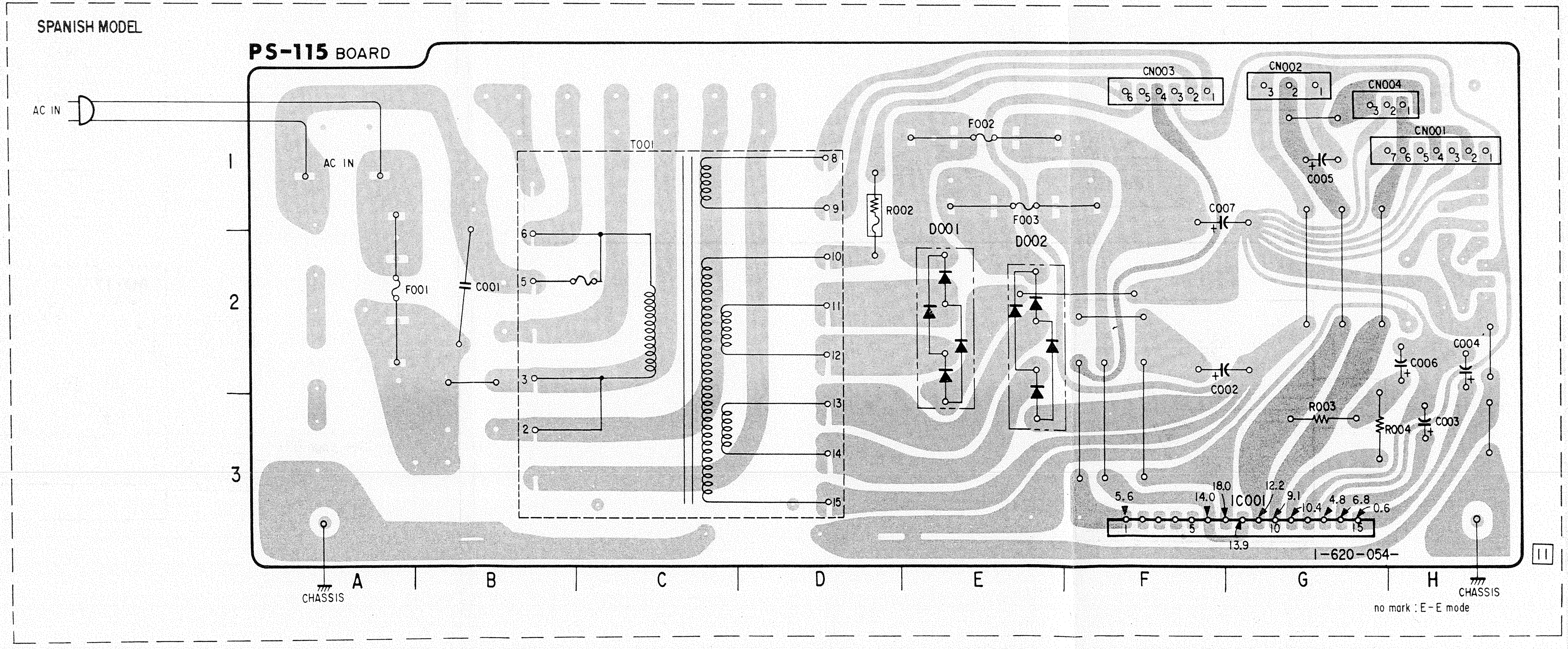
—Ref. No. PS-115, VS-11 BOARDS : 6,000 series—

Note:

- ○— : indicates a lead wire mounted on the component side.
- ▨ : soldering side.
- ▨ : B+ Pattern.

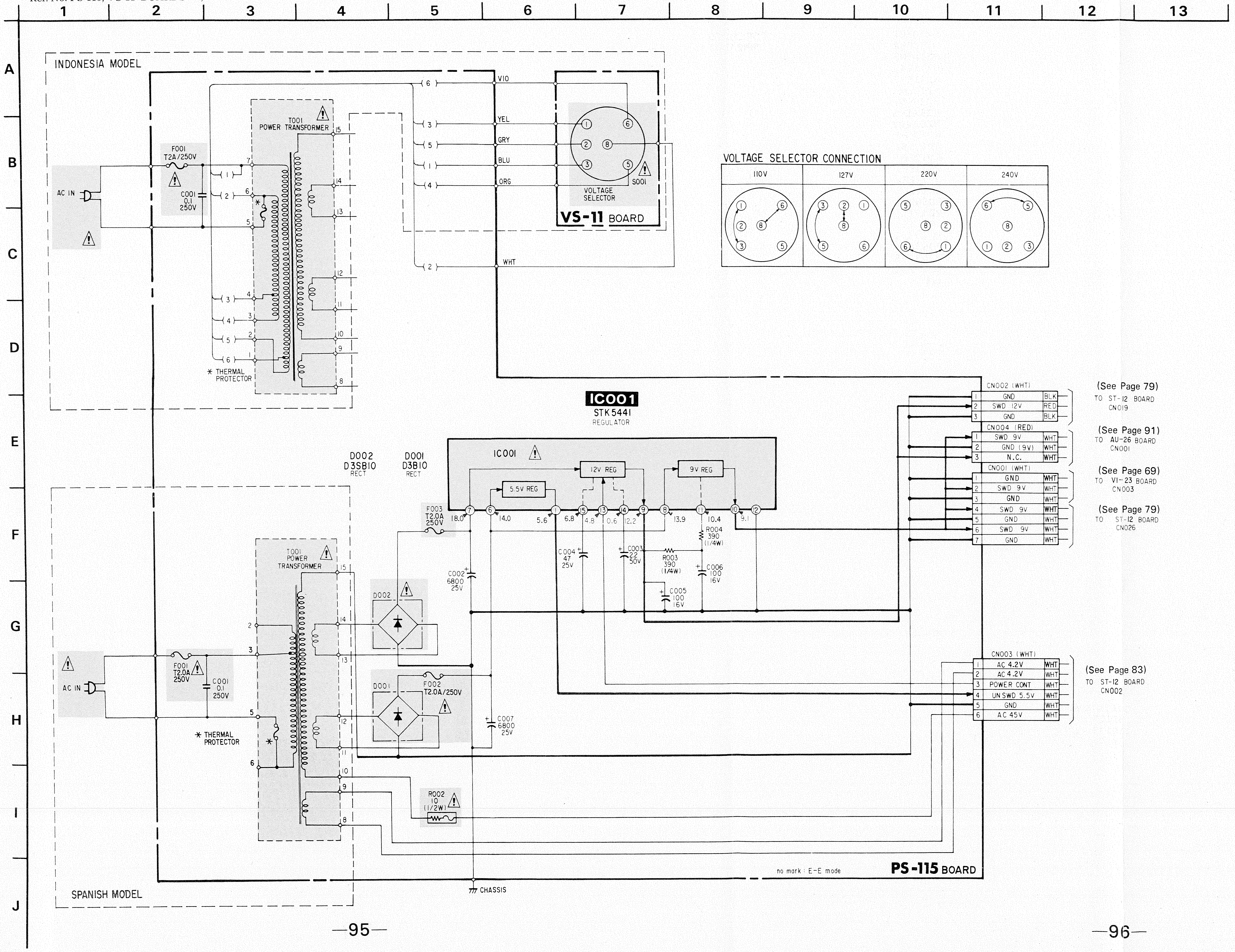

PS-115
(Power Supply)
VS-11
(Voltage Selector)


INDONESIA MODEL
PS-115 BOARD
VS-11 BOARD
AC IN
WHT
VIO
GRY
YEL
BLU
ORG
S001 VOLTAGE SELECTOR
T001
F001
F002
F003
C001
C002
C003
C004
C005
C006
C007
R002
R003
R004
D001
D002
IC001
CN001
CN002
CN003
CN004
18.0
14.0
12.2
13.9
10.4
9.1
5.6
4.8
6.8
0.6
1-620-055-
1-620-054-
11
CHASSIS
no mark : E-E mode


SPANISH MODEL
PS-115 BOARD
AC IN
T001
F001
F002
F003
C001
C002
C003
C004
C005
C006
C007
R002
R003
R004
D001
D002
IC001
CN001
CN002
CN003
CN004
18.0
14.0
12.2
13.9
10.4
9.1
5.6
4.8
6.8
0.6
1-620-054-
11
1
2
3
A
B
C
D
E
F
G
H
CHASSIS
no mark : E-E mode

PS-115 (POWER SUPPLY), VS-11 (VOLTAGE SELECTOR) SCHEMATIC DIAGRAM

—Ref. No. PS-115, VS-11 BOARDS : 6,000 series—


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
INDONESIA MODEL
AC IN
F001
T2A/250V
C001
0.1
250V
T001
POWER TRANSFORMER
＊ THERMAL PROTECTOR
VIO
YEL
GRY
BLU
ORG
WHT
VOLTAGE SELECTOR
S001
VS-11 BOARD
VOLTAGE SELECTOR CONNECTION
110V
127V
220V
240V
SPANISH MODEL
F001
T2.0A
250V
C001
0.1
250V
T001
POWER TRANSFORMER
＊ THERMAL PROTECTOR
D002
D3SB10
RECT
D001
D3B10
RECT
F003
T2.0A
250V
C002
6800
25V
F002
T2.0A/250V
C007
6800
25V
R002
10
(1/2W)
IC001
STK5441
REGULATOR
IC001
5.5V REG
12V REG
9V REG
18.0
14.0
5.6
6.8
4.8
0.6
12.2
13.9
10.4
9.1
C004
47
25V
C003
22
50V
R003
390
(1/4W)
R004
390
(1/4W)
C006
100
16V
C005
100
16V
CHASSIS
no mark : E-E mode
PS-115 BOARD
CN002 (WHT)
1 GND BLK
2 SWD 12V RED
3 GND BLK
CN004 (RED)
1 SWD 9V WHT
2 GND (9V) WHT
3 N.C. WHT
CN001 (WHT)
1 GND WHT
2 SWD 9V WHT
3 GND WHT
4 SWD 9V WHT
5 GND WHT
6 SWD 9V WHT
7 GND WHT
CN003 (WHT)
1 AC 4.2V WHT
2 AC 4.2V WHT
3 POWER CONT WHT
4 UN SWD 5.5V WHT
5 GND WHT
6 AC 45V WHT
(See Page 79)
TO ST-12 BOARD CN019
(See Page 91)
TO AU-26 BOARD CN001
(See Page 69)
TO VI-23 BOARD CN003
(See Page 79)
TO ST-12 BOARD CN026
(See Page 83)
TO ST-12 BOARD CN002

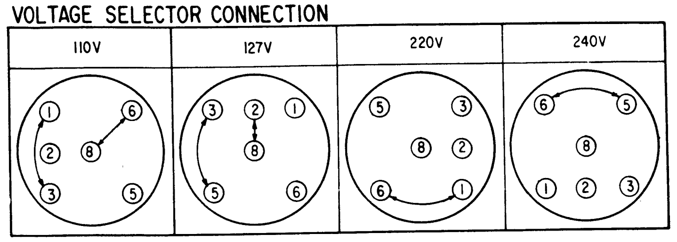
Note:

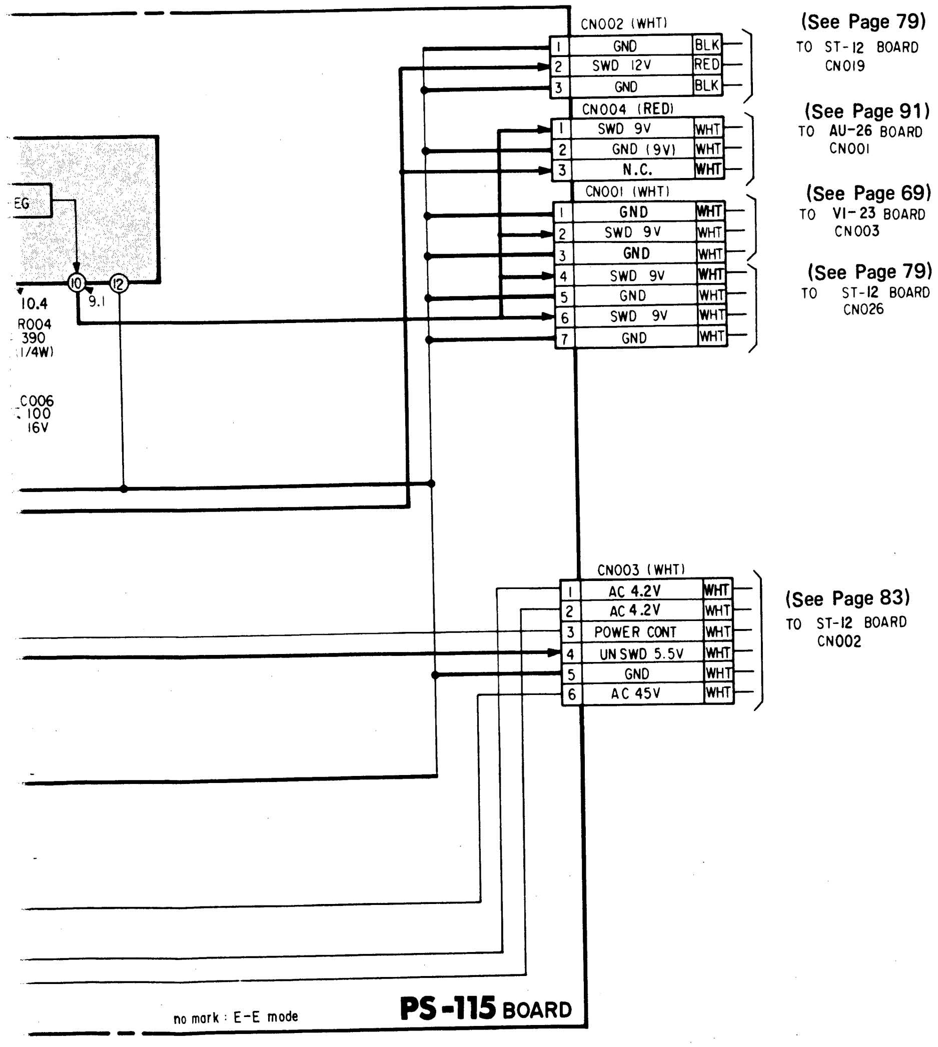
- All resistors are in ohms, 1/6W unless otherwise no
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF
  or less are not indicated except for electrolytics. a
- All variable and adjustable resistors have characte
  unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ▬ : B + bus.
- Voltages are dc with respect to ground unless othe
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10
- Voltage variations may be noted due to norm
  tolerances.

When indicating parts by reference number, please include the board name.

Note: The components identified by shading ar ⚠ are critical for safety. Replace on part number specified.

VOLTAGE SELECTOR CONNECTION


110V
127V
220V
240V
①
②
③
⑤
⑥
⑧


CN002 (WHT)
1 GND BLK
2 SWD 12V RED
3 GND BLK
(See Page 79)
TO ST-12 BOARD CN019
CN004 (RED)
1 SWD 9V WHT
2 GND (9V) WHT
3 N.C. WHT
(See Page 91)
TO AU-26 BOARD CN001
CN001 (WHT)
1 GND WHT
2 SWD 9V WHT
3 GND WHT
4 SWD 9V WHT
5 GND WHT
6 SWD 9V WHT
7 GND WHT
(See Page 69)
TO VI-23 BOARD CN003
(See Page 79)
TO ST-12 BOARD CN026
EG
⑩
⑫
10.4
9.1
R004
390
1/4W
C006
100
16V
CN003 (WHT)
1 AC 4.2V WHT
2 AC 4.2V WHT
3 POWER CONT WHT
4 UN SWD 5.5V WHT
5 GND WHT
6 AC 45V WHT
(See Page 83)
TO ST-12 BOARD CN002
no mark : E-E mode
PS-115 BOARD

Note:

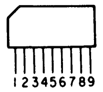
- All resistors are in ohms, 1/6W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics. and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- — : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

When indicating parts by reference number, please include the board name.

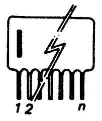
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

4-3. SEMICONDUCTORS

BA4561
LA7205
μPC1521HA

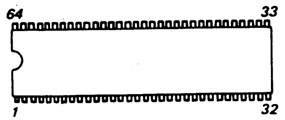


BX-1387



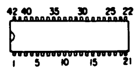
(Marking side view)

CXP5016-155-S



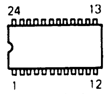
(Top view)

CX10021A-NP
CX10021A-P
CX10021B-NP
CX10021B-P


42 40 35 30 25 22
1 5 10 15 21

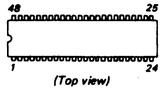
(Top view)

CX10023



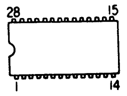
(Top view)

CX20043
CX20124A
CX20124B



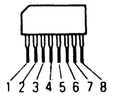
(Top view)

CX20045
CX-866A
CX-866B

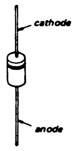


(Top view)

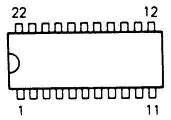
CX20061
M54572L



HZT33-02

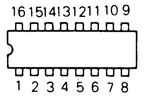

cathode
anode

LA7091



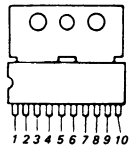
(Top view)

LB1205
LB1211
MB88201H-507M
MC14538BCP
TC4053BP
μPD4053BC

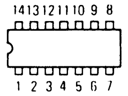

16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8

(Top view)

LB1640N

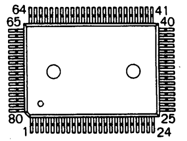

1 2 3 4 5 6 7 8 9 10

MB84013B
M58655P
μPC324C


14 13 12 11 10 9 8
1 2 3 4 5 6 7

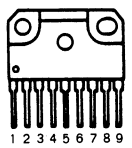
(Top view)

MB88551-222N

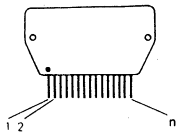

64
41
65
40
80
25
1
24

MARKING SIDE VIEW

M54543L

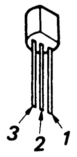


STK5441

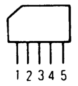


MARKING SIDE VIEW

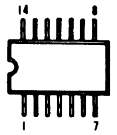
S-8053ALR



TA7060AP

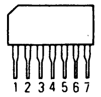


TC504013BP

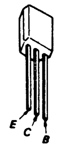


(TOP VIEW)

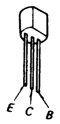
μPC1513HA



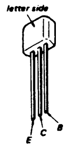
DTA114ES
DTA124ES
DTC114ES
DTC124ES
DTC143TS
DTC144ES
DTC144WS
2SA933
2SA1048-Y
2SA1048-GR
2SA1115
2SC403SP-3
2SC403SP-4
2SC403SP-5
2SC1740S
2SC2458
2SC2603



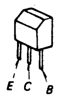
2SA844



2SA1175
2SC2785


letter side
E C B

2SB733
2SD733
2SD774



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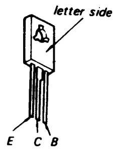
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E C B

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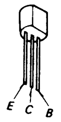

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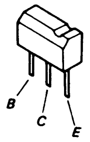

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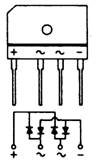

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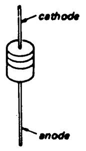
cathode
anode

HZ10EB1
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HZ11EB1
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HZ11EB3
HZ36EB2
HZ5.6EB3
HZ6.2EB2
RD10EB1
RD10EB2
RD10EB3
RD11EB1
RD11EB2
RD11EB3
RD36EB2
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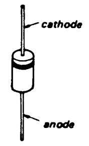
RK4.7EL2
RD4.7EL3
RD5.1EL2
RD5.6EB3
RD6.2EB2
11ES2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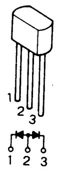

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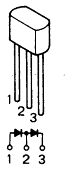

SPI201-20
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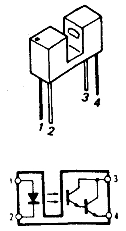

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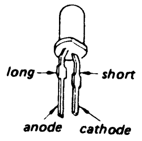
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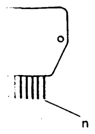
anode
cathode

41

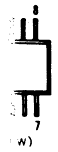


DE VIEW

ALR

DAP

13BP



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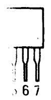

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DTC124ES
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DTC144ES
DTC144WS
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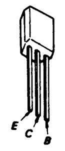

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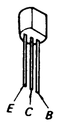

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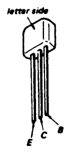
letter side
E
C
B

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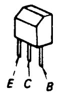
2SD774



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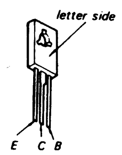
letter side
E
C
B

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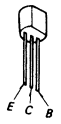

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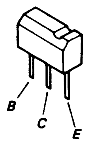

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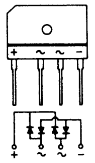

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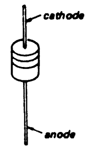
cathode
anode

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HZ10EB2
HZ10EB3
HZ11EB1
HZ11EB2
HZ11EB3
HZ36EB2
HZ5.6EB3
HZ6.2EB2
RD10EB1
RD10EB2
RD10EB3
RD11EB1
RD11EB2
RD11EB3
RD36EB2
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RK4.7EL2
RD4.7EL3
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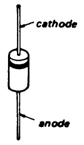
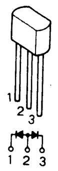
RD5.6EB3
RD6.2EB2
11ES2


cathode
anode

MC921



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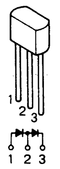
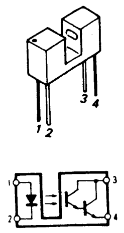


SPI201-20
SPI201-21



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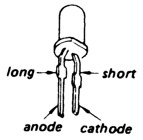

long
short
anode
cathode

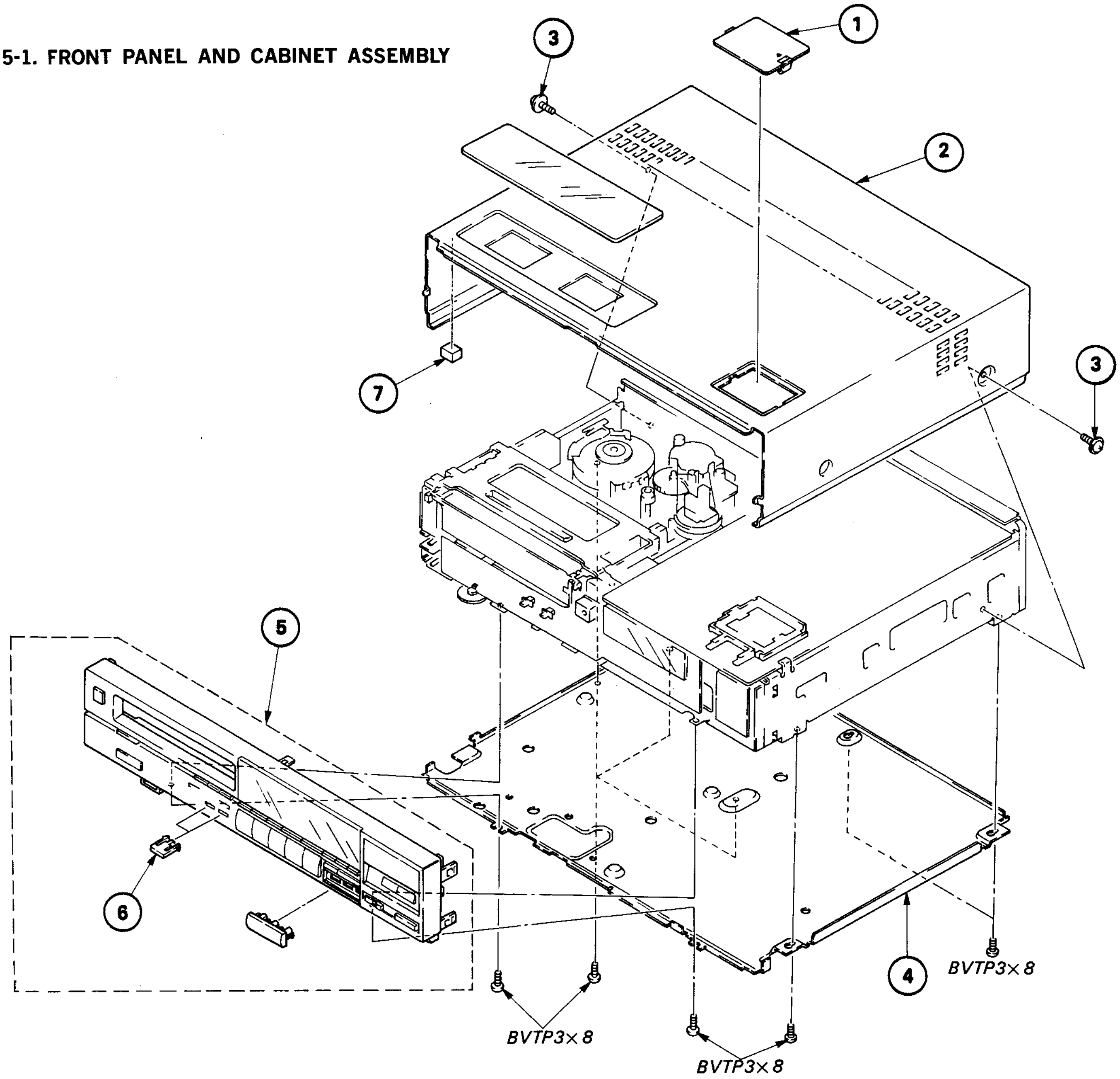
SECTION 5
EXPLODED VIEWS

NOTE:

- Itmes with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

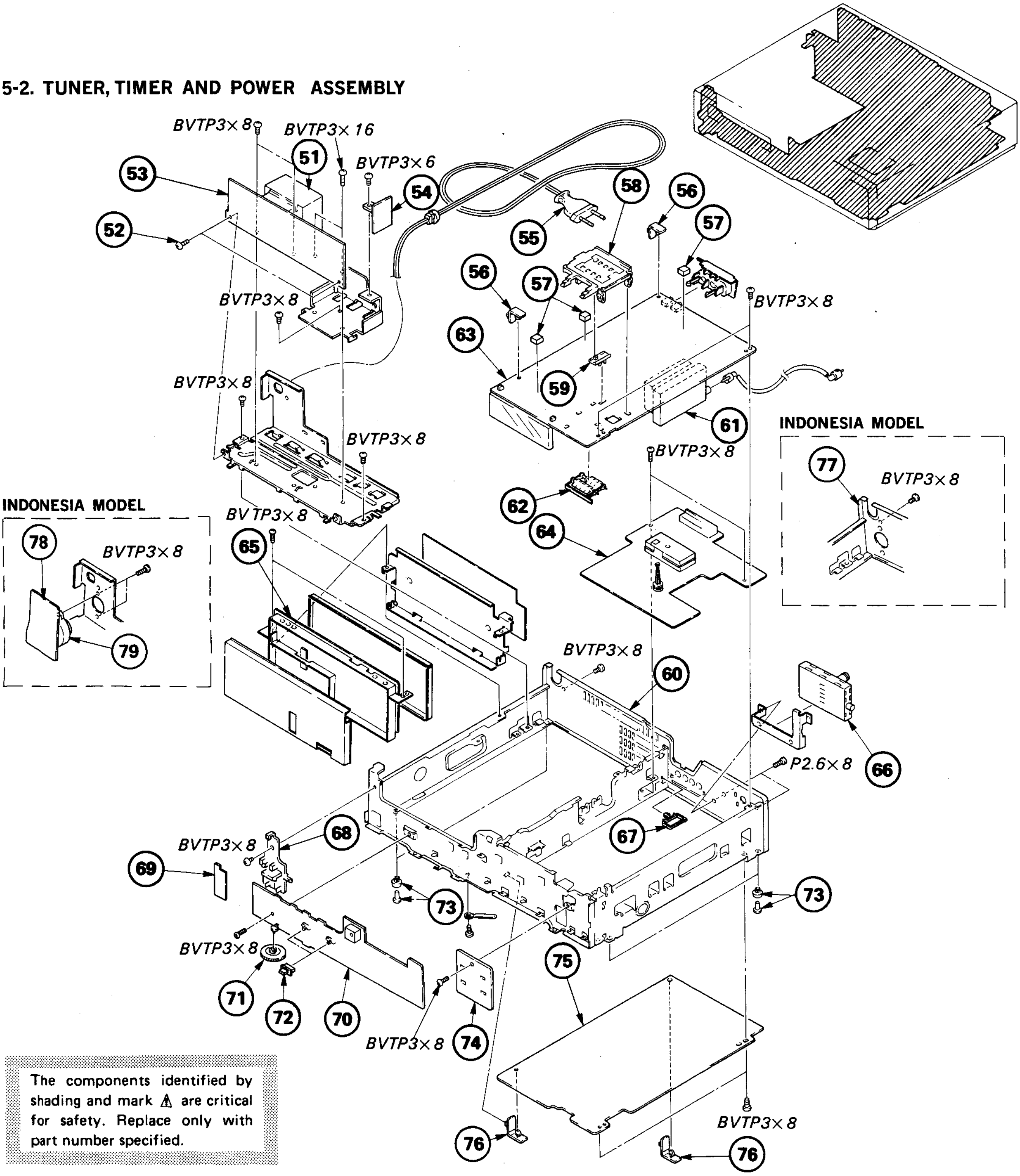
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

5-1. FRONT PANEL AND CABINET ASSEMBLY



No.	Part No.	Description	Remark
1	3-693-865-11	LID, PRESET	
2	X-3710-522-1	CASE ASSY, UPPER	7
3	4-886-821-01	SCREW, M3 CASE	
4	*3-693-889-06	PLATE, BOTTOM	
5	X-3710-521-1	PANEL ASSY, FRONT	6
6	3-684-312-01	BUTTON, SI	
7	9-911-840-XX	RUBBER (B)	

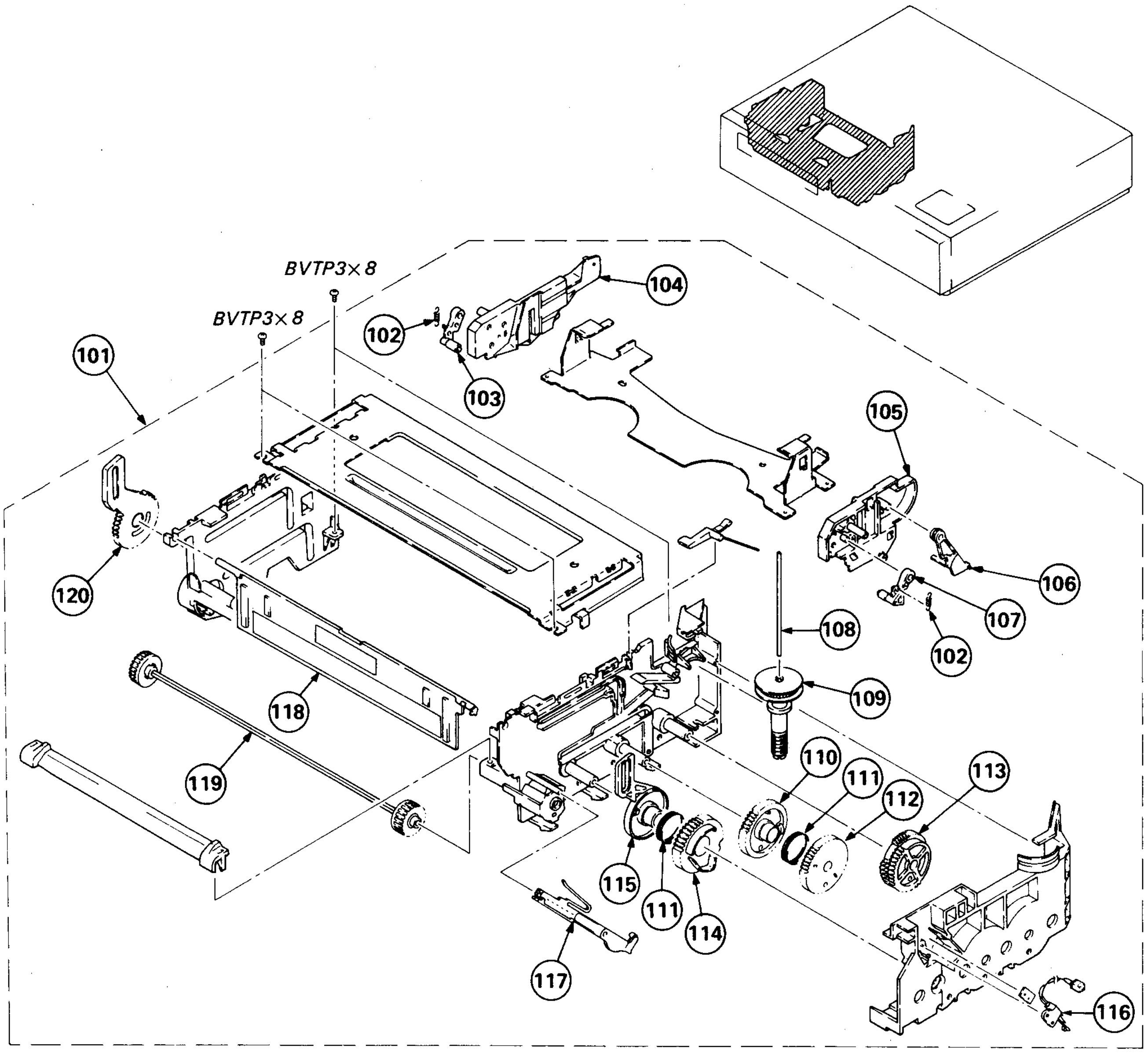
5-2. TUNER, TIMER AND POWER ASSEMBLY



The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

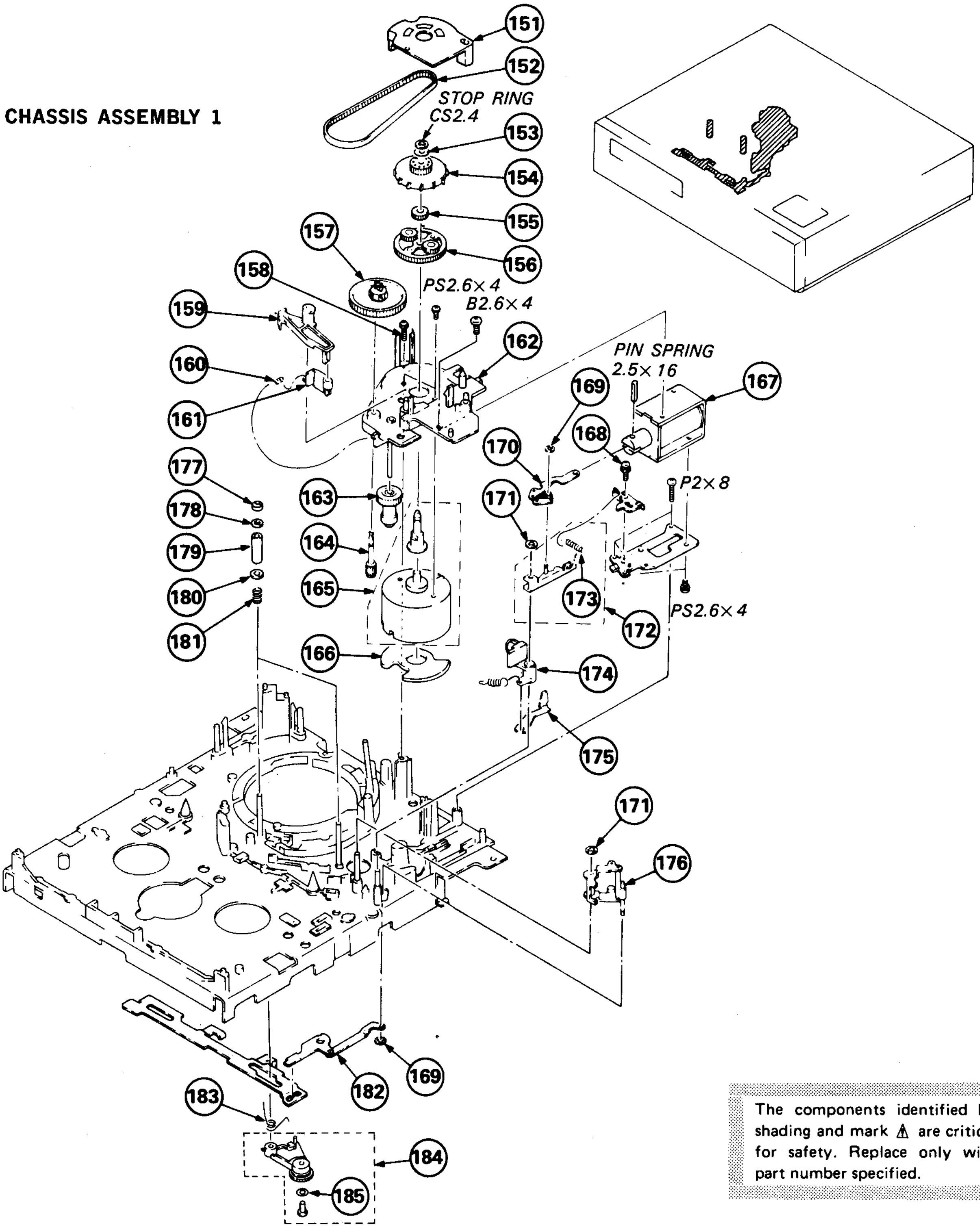
No.	Part No.	Description	Remark
51	⚠.1-448-656-11	TRANSFORMER, POWER (SPANISH MODEL)	
	⚠.1-448-657-11	TRANSFORMER, POWER (INDONESIA MODEL)	
52	3-693-912-01	SCREW (3X8), TAPPING	
53	*1-620-054-11	PS-115 BOARD	
54	*0-371-032-	DR-38 BOARD	
55	⚠.1-551-908-61	CORD, POWER, EULO PLUG	
56	*3-710-565-01	HINGE, PC BOARD	
57	9-911-842-XX	RUBBER (B)	
58	X-3710-520-1	COVER ASSY, PRESET	
59	3-693-842-01	BUTTON, AFT	
60	*3-710-596-01	PLATE (P), JACK	
61	⚠.1-463-584-11	TUNER, ET (BT-881A)	
62	*X-3693-812-1	SHAFT ASSY, PRESET	
63	*A-6715-332-A	ST-12 BOARD, COMPLETE	
64	*A-6713-266-A	AU-26 BOARD, COMPLETE	
65	*A-6711-766-A	RP-41 BOARD, COMPLETE	
66	1-464-690-11	MODULATOR, RF (RFU-857)	
67	*3-695-074-01	CLAMP, WIRE	
68	3-710-533-01	HOLDER, JACK	
69	*1-620-051-11	MF-15 BOARD	
70	*1-620-052-11	MF-16 BOARD	
71	3-710-584-01	KNOB, SHARPNESS	
72	3-684-325-01	BUTTON, SLIDE	
73	3-670-155-11	LEG	
74	*1-620-053-11	MF-17 BOARD	
75	*A-6711-767-A	VI-23 BOARD, COMPLETE	
76	*3-701-832-00	HINGE, CIRCUIT BOARD	
77	*3-710-596-11	PLATE (P), JACK (INDONESIA MODEL)	
78	*1-620-055-11	VS-11 BOARD (INDONESIA MODEL)	
79	⚠.1-552-304-11	SELECTOR, VOLTAGE S905 (INDONESIA MODEL)	

5-3. FRONT LOADING ASSEMBLY


BVTP3×8
BVTP3×8
101
102
103
104
105
106
107
102
108
109
110
111
112
113
120
118
119
115
111
114
117
116

No.	Part No.	Description	Remark
101	A-6751-317-A	THREADING BLOCK ASSY, FRONT	102-120
102	3-684-258-01	SPRING, TENSION	
103	X-3684-125-1	RETAINER (LEFT) ASSY, CASSETTE	
104	*X-3693-803-1	PLATE ASSY, SIDE, LEFT, BASE	
105	*X-3684-118-1	PLATE ASSY, SIDE, RIGHT	
106	*3-684-108-01	ARM, LID OPEN	
107	X-3684-124-1	RETAINER (RIGHT) ASSY, CASSETTE	
108	3-679-123-00	SHAFT, GEAR, WORM	
109	X-3693-804-1	GEAR ASSY, WORM	
110	3-684-111-01	GEAR (B), LIMITER	
111	3-684-115-01	SPRING	
112	3-684-109-01	GEAR (A), LIMITER	
113	X-3684-123-1	GEAR ASSY, DRIVING	
114	3-684-163-01	GEAR, DRIVING ARM	
115	3-684-165-01	ARM (RIGHT), DRIVING	
116	1-554-840-11	SWITCH, LEAF (CASSETTE IN) S904	
117	*3-693-854-01	ARM, SWITCHING, DOOR	
118	3-684-168-31	DOOR	
119	X-3684-116-1	SHAFT ASSY, MIDWAY GEAR	
120	*3-684-166-01	ARM (LEFT), DRIVING	

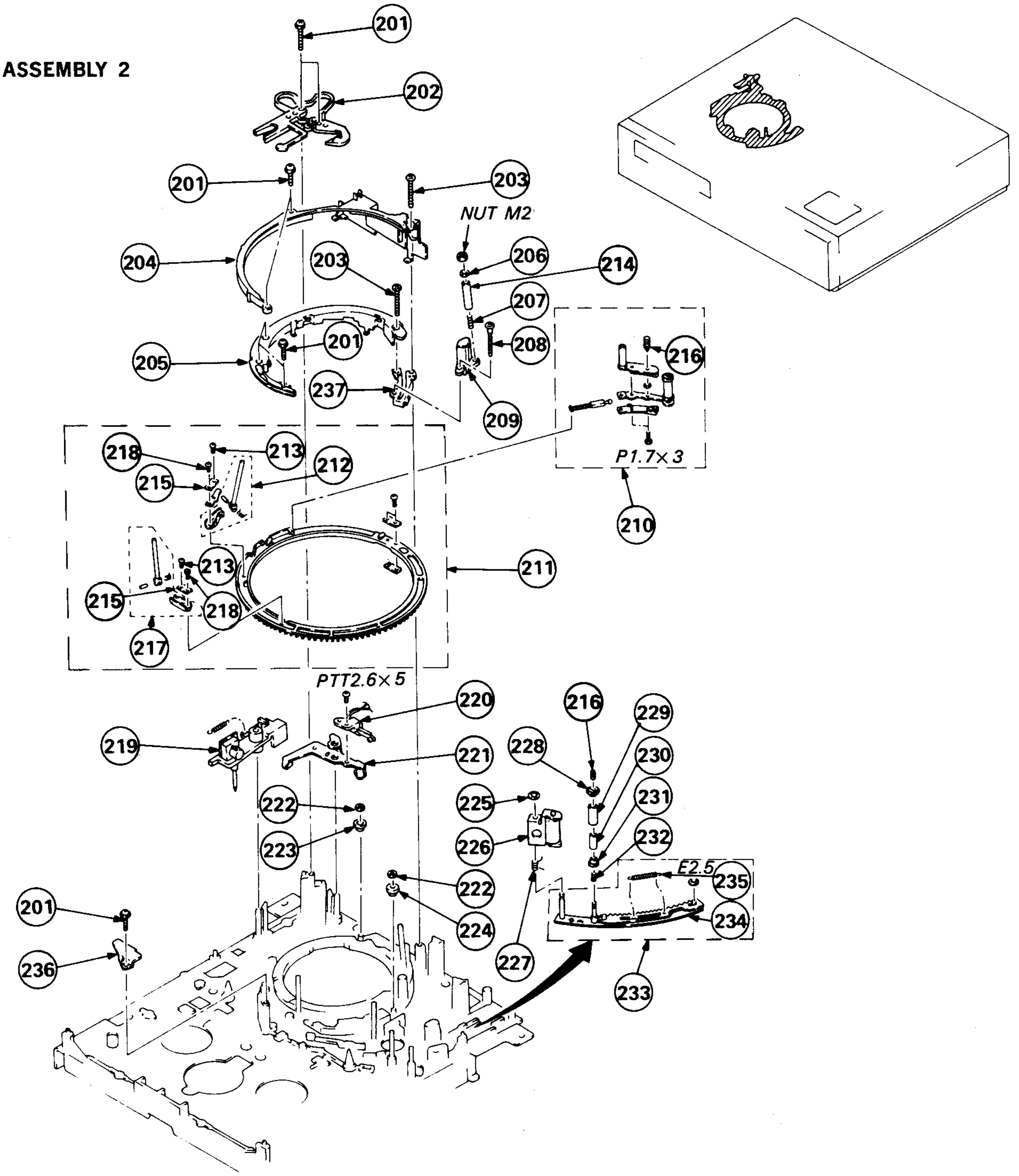
5-4. CHASSIS ASSEMBLY 1


151
152
STOP RING
CS2.4
153
154
155
156
157
158
PS2.6×4
B2.6×4
159
162
PIN SPRING
2.5×16
167
160
169
161
168
170
P2×8
177
163
171
178
164
179
165
173
180
172
PS2.6×4
181
166
174
175
171
176
169
183
182
184
185

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remark
151	*3-693-866-01	HOLDER, GEAR, PLANET	
152	3-684-264-01	BELT, TIMING	
153	3-683-454-01	WASHER, POLYETHYLENE	
154	3-684-178-01	GEAR, INTERNAL	
155	3-679-104-05	GEAR	
156	X-3679-111-0	CARRIER ASSY	
157	3-679-115-00	GEAR (LARGE), LOADING	
158	3-669-480-11	+ PTPWH 2	
159	3-684-167-01	ARM, STOPPER	
160	3-684-227-01	SPRING, TENSION	
161	3-684-116-01	LIMITER, STOPPER	
162	X-3693-809-1	CHASSIS ASSY, PLANET GEAR	
163	X-3669-321-0	GEAR (C) ASSY	
164	3-679-114-00	GEAR (SMALL), LOADING	
165	X-3679-268-1	MOTOR ASSY, L (LOADING/THREADING) M904	
166	*1-614-597-11	LM-16 BOARD	
167	⚠1-454-365-51	SOLENOID, PLUNGER (PINCH) PM901	
168	3-669-607-00	+PSW (SMALL ROUND) 2.6	
169	3-669-465-00	WASHER (1.5), STOPPER	
170	X-3684-109-1	ARM ASSY, PINCH SOLENOID	
171	3-669-595-00	WASHER (2), STOPPER	
172	*X-3684-112-1	ARM ASSY, PINCH LIMITER	173
173	3-515-170-00	SPRING, TENSION	
174	X-3693-830-1	SENSOR BLOCK ASSY, T L902	
175	*3-684-119-01	LINK, TAKE-UP SENSOR	
176	*X-3693-807-1	ARM ASSY, PRESS, PINCH	
177	3-669-318-21	NUT, ADJUSTMENT, GUIDE	
178	3-684-135-01	WASHER (UPPER), GUIDE, #7, 8	
179	3-693-830-01	SLEEVE, GUIDE, #7, #8	
180	3-693-831-01	WASHER, GUIDE	
181	3-693-943-01	SPRING (#7, #8), COMPRESSION	
182	*X-3684-114-1	LEVER ASSY, COMMUNICATION	
183	3-681-154-00	SPRING, TORSION	
184	X-3687-503-1	ARM ASSY, REVIEW BRAKE	185
185	3-701-436-11	WASHER, 1.6	

5-5. CHASSIS ASSEMBLY 2


201
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NUT M2
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203
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214
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208
205
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237
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P1.7×3
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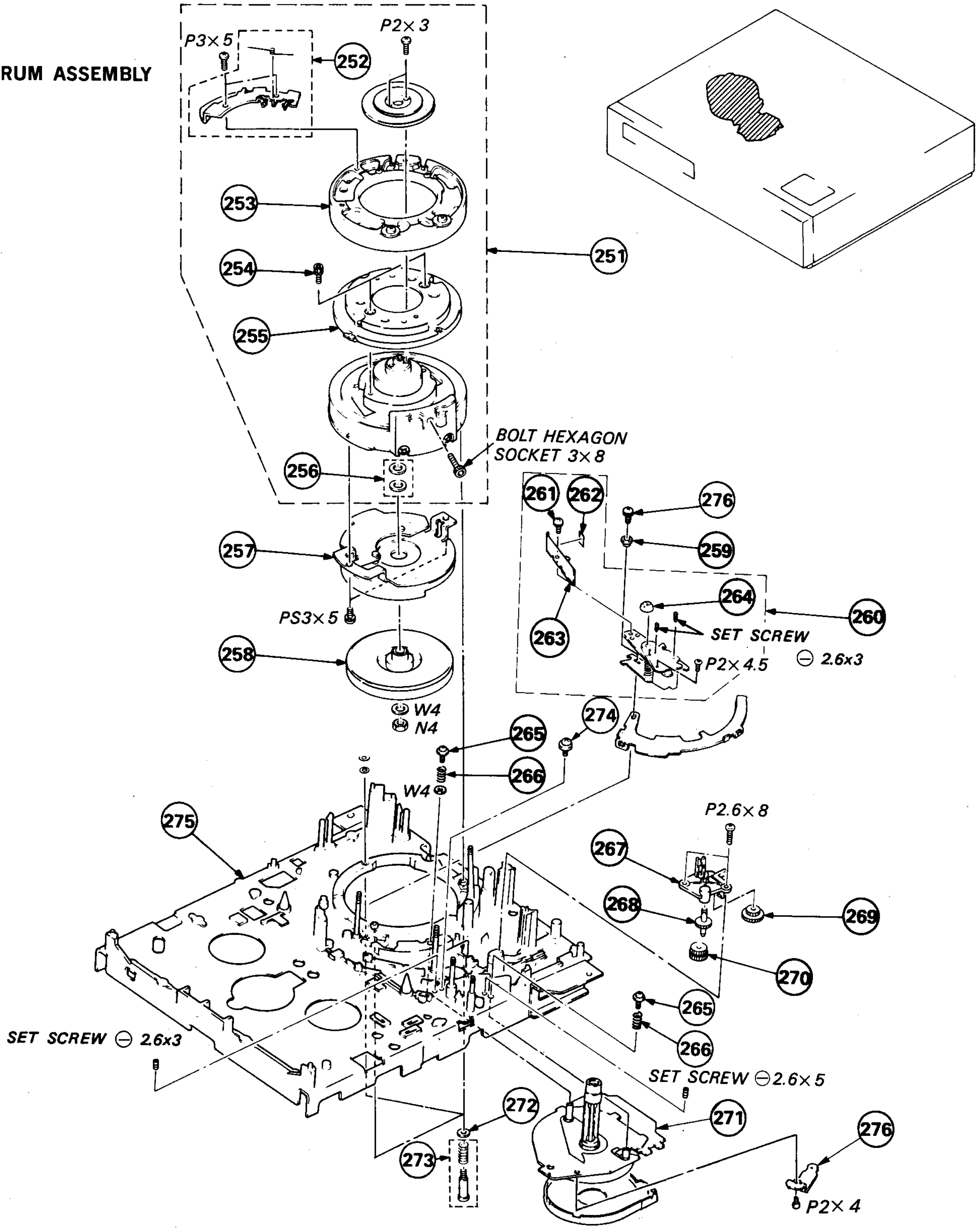
213
212
215
210
213
211
215
218
217
PTT2.6×5
220
216
229
219
228
221
230
222
225
231
223
226
232
E2.5
235
201
222
234
224
236
227
233

No.	Part No.	Description	Remark
201	3-669-480-11	+ PTPWH 2	
202	3-693-867-01	PLATE (2&3), ADJUSTMENT	
203	3-669-466-21	SCREW (M 2.6)	
204	3-684-217-04	GUIDE (2), SHUTTLE	
205	*3-679-290-00	GUIDE (1-YA), SHUTTLE	
206	3-679-910-00	FLANGE (S), GUIDE, NUMBER 6	
207	3-693-942-01	SPRING (#6), COMPRESSION	
208	3-669-606-00	SCREW (2.6)	
209	8-825-508-50	HEAD, FULL ERASE EF282-21	
210	A-6750-197-A	SHUTTLE (4) BLOCK ASSY, THREADING	216
211	X-3684-178-1	RING (CF) ASSY, S THREADING	212, 213 215, 217, 218
212	X-3669-430-0	HOLDER BLOCK ASSY, #3 GUIDE	
213	3-669-478-00	SCREW (1X3), TAPPING	
214	3-691-830-01	SLEEVE, GUIDE, #6	
215	*3-669-472-02	RETAINER, SPRING, LEAF	
216	3-694-230-01	SCREW (2X2.5), FLANGE	
217	X-3669-429-0	HOLDER BLOCK ASSY, #2 GUIDE	
218	3-672-586-00	SCREW (1.4X3), TAPPING	
219	X-3693-829-1	SENSOR BLOCK ASSY, S L901	
220	1-554-840-11	SWITCH, LEAF (THREADING END) S903	
221	*X-3684-130-1	ARM ASSY, LOCK	
222	3-669-465-00	WASHER (1.5), STOPPER	
223	3-669-360-00	ROLLER, RING	
224	3-669-597-00	ROLLER (B), RING	
225	3-669-596-00	WASHER (2.3), STOPPER	
226	X-3691-646-1	ARM ASSY, PINCH ROLLER	
227	3-683-441-01	SPRING	
228	3-676-650-00	FLANGE (UPPER) (#9), GUIDE	
229	3-676-649-11	ROLLER (#9), GUIDE	
230	3-672-559-00	SLEEVE, GUIDE	
231	3-669-432-00	FLANGE (LOWER) (#9), GUIDE	
232	3-693-941-01	SPRING (#9), COMPRESSION	
233	A-6750-165-A	GEAR ASSY, SLIDER	234, 235
234	*X-3679-265-1	SLIDER ASSY (2), T	
235	3-549-014-00	SPRING, TENSION	
236	3-669-476-04	PLATE, GUIDE	
237	*X-3679-263-1	BASE ASSY, SLANT	

5-6. DRUM ASSEMBLY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253
251
254
255
BOLT HEXAGON SOCKET 3×8
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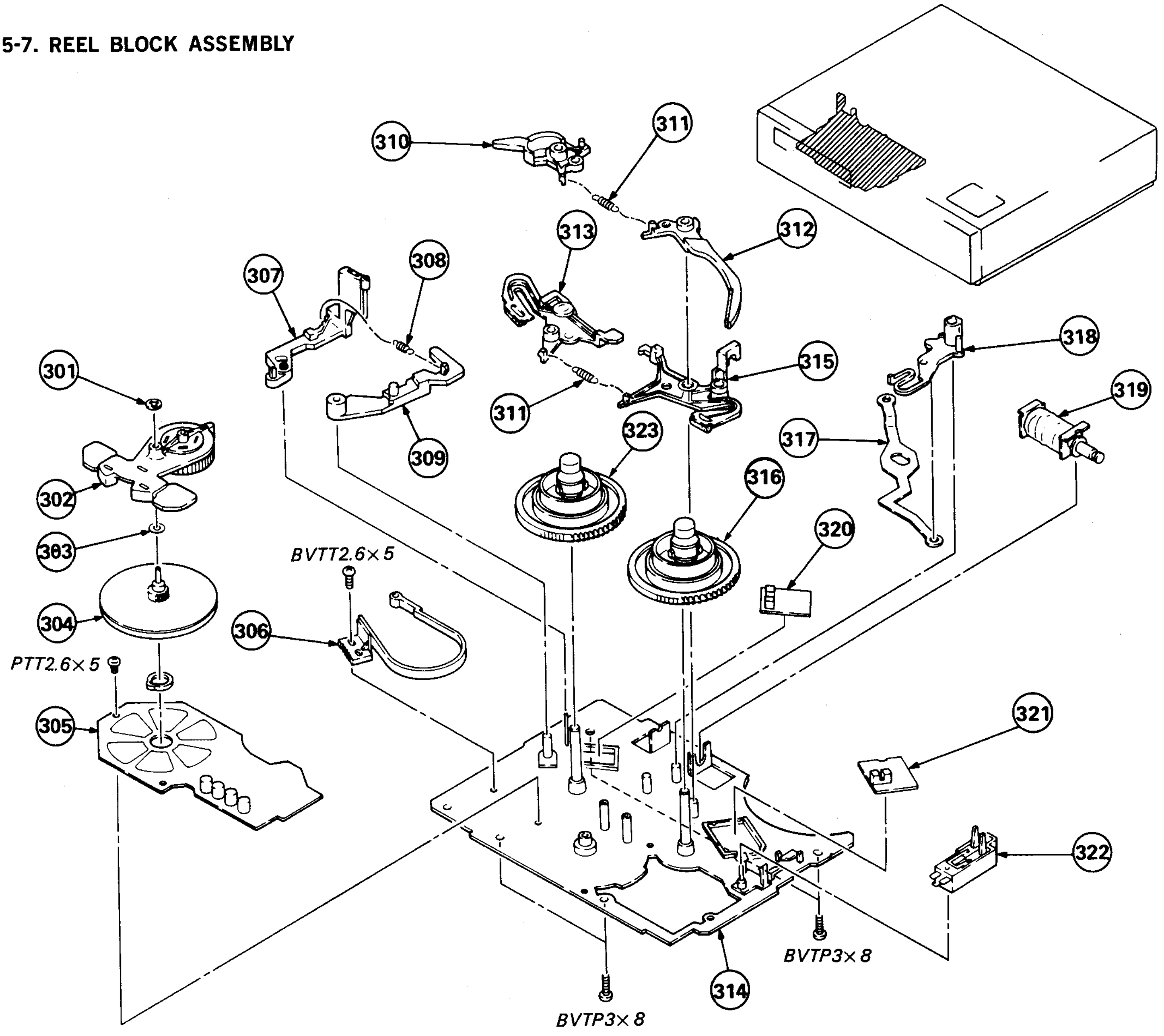
261
262
276
259
264
260
263
SET SCREW ⊖ 2.6x3
P2×4.5
257
PS3×5
258
W4
N4
274
265
266
W4
275
P2.6×8
267
268
269
270
265
266
SET SCREW ⊖ 2.6x3
SET SCREW ⊖2.6×5
272
271
276
273
P2×4

No.	Part No.	Description	Remark
251	A-6050-445-A	DRUM ASSY, (DSH-86A-R)	252-256
252	A-6760-066-B	SPRING ASSY, TAPE RETAINER	
253	A-6760-138-A	DRUM ASSY, UPPER	
254	3-669-157-00	BOLT (WASHER) (2.6X8)	
255	A-6762-290-A	DISC ASSY (DSR-86-R)	
256	X-3669-105-0	SPACER BLOCK ASSY	
257	X-2621-228-1	D STATOR ASSY	
258	X-2621-202-0	D ROTOR ASSY	
259	3-684-247-01	BUSHING, ACE	
260	A-6761-115-A	ACE ASSY	
261	3-693-439-11	SCREW (P2.6X5), (+)	
262	3-693-904-01	SHEET (P), INSULATING	
263	3-693-895-01	PROTECTOR (S)	
264	3-684-246-02	NUT, ADJUSTMENT, HEIGHT, ACE	
265	3-669-633-00	SCREW, + PW2	
266	3-679-359-00	SPRING, COMPRESSION	
267	*X-3693-805-1	CHASSIS ASSY, DRIVE GEAR	
268	*X-3693-806-1	GEAR (F) ASSY	
269	3-669-337-00	GEAR (D)	
270	3-669-338-00	GEAR (E)	
271	8-835-201-01	MOTOR, DC BHF-1914B (CAPSTAN) M902	
272	3-669-600-11	WASHER, FLAT (3.5)	
273	X-3693-838-3	SCREW ASSY, FITTING	
274	3-693-932-01	SCREW (2.6X5), W (+) P	
275	*X-3693-816-3	CHASSIS ASSY, MECHANICAL	
276	3-693-439-01	SCREW (P2.6X12), (+)	

5-7. REEL BLOCK ASSEMBLY


310
311
312
313
307
308
318
301
315
319
311
317
323
309
316
302
320
303
BVTT2.6×5
304
306
PTT2.6×5
321
305
322
BVTP3×8
314
BVTP3×8

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remark
301	3-669-595-00	WASHER (2), STOPPER	
302	A-6759-074-A	ARM BLOCK ASSY, PENDULUM	
303	3-679-318-00	WASHER, PENDULUM ARM	
304	X-2622-205-1	ROTOR ASSY, R	
305	A-4910-063-B	R STATOR BOARD, COMPLETE (REEL MOTOR)	M903
306	X-3679-120-0	BAND ASSY, TENSION REGULATOR	
307	X-3684-121-1	LEVER ASSY, TENSION REGULATOR	
308	3-679-151-00	SPRING, TENSION	
309	3-693-869-01	LEVER, FUNCTION	
310	3-684-192-01	ARM, BRAKE, SUPPLY SOFT	
311	3-684-235-01	SPRING, TENSION	
312	X-3684-137-1	BRAKE ASSY, T SOFT	
313	X-3684-107-1	BRAKE ASSY, SUPPLY	
314	*X-3693-813-1	CHASSIS ASSY, SUB	
315	X-3684-108-1	BRAKE ASSY, TAKE-UP	
316	X-3684-106-1	TABLE ASSY, REEL	
317	*3-684-183-01	LINK, L	
318	3-684-193-01	ARM, PENDULUM STOPPER	
319	⚠ 1-454-371-51	SOLENOID, PLUNGER (BRAKE)	PM902
320	*1-614-829-11	MI-6 BOARD	
321	*1-614-828-11	MI-5 BOARD	
322	1-554-839-11	SWITCH, LEAF (2 GANG) (REC PROOF/CASSETTE DOWN)	S901
323	X-3710-506-1	REEL ASSY, ONE-WAY	

5-8. HARDWARE LIST

SET-SCREW

7-621-712-26	SET-SCREW, SLOT 2.6X3FLAT POINT
7-621-712-46	SET-SCREW, SLOT 2.6X5FLAT POINT
7-683-174-21	SET-SCREW, SLOT 3X4 CONE POINT

NUT

7-622-205-05	NUT M2 TYPE2

RING

7-624-118-01	RING, RETAINING E-2.5
7-624-190-61	STOP RING 2.4, TYPE-CS

TAPPING

7-685-105-14	TPG +P 2X8, TYPE 2, NON-SLIT

SCREW

7-621-255-25	SCREW +P 2X4
7-621-775-15	SCREW +B 2.6X4
7-627-552-38	SCREW, PRECISION +P 1.7X3
7-627-553-58	SCREW, PRECISION +P 2X4.5
7-627-554-07	SCREW, PRECISION +P 2X2.2
7-628-253-95	SCREW +PS 2.6X4
7-685-132-14	SCREW +P 2.6X5 TYPE2 NON-SLIT
7-685-134-14	SCREW +P 2.6X8 TYPE2 NON-SLIT
7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3
7-685-646-81	SCREW +BVTP 3X8 TYPE2
7-685-650-71	SCREW +BVTP 3X16 TYPE2 IT-3
7-685-650-81	SCREW +BVTP 3X16 TYPE2
7-685-791-04	SCREW +PTT 2.6X5 (S)

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms
- F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS

- MF : μF, PF : μμF

COILS

- MMH : mH, UH : μH

Ref.No	Part No.	Description			Remark
	*A-4910-063-B	R STATOR (REEL MOTOR) BOARD, COMPLETE			
		**			
	*1-560-460-00	PIN, CONNECTOR 4P			
	*1-560-461-00	PIN, CONNECTOR 5P			
		CAPACITOR			
C1	1-123-821-00	ELECT	47MF	20%	16V
C2	1-123-821-00	ELECT	47MF	20%	16V
C3	1-123-821-00	ELECT	47MF	20%	16V
C4	1-123-821-00	ELECT	47MF	20%	16V
		DIODE			
H1	8-719-800-31	DIODE THS103A-1			
H2	8-719-800-31	DIODE THS103A-1			
		IC			
IC1	8-759-801-97	IC LB1615			
		RESISTOR			
R1	1-247-823-00	CARBON	470	5%	1/6W
R2	1-249-429-11	CARBON	10K	5%	1/6W
R3	1-249-437-11	CARBON	47K	5%	1/6W
R4	1-249-437-11	CARBON	47K	5%	1/6W
R5	1-249-437-11	CARBON	47K	5%	1/6W
R6	1-249-437-11	CARBON	47K	5%	1/6W
***					
	*A-6711-766-A	RP-41 BOARD, COMPLETE			
		***********************			
		CAPACITOR			
C001	1-101-004-00	CERAMIC	0.01MF		50V
C002	1-101-004-00	CERAMIC	0.01MF		50V
C003	1-123-356-00	ELECT	10MF	20%	16V
C005	1-130-495-00	MYLAR	0.1MF	5%	50V
C006	1-161-025-00	CERAMIC	0.1MF	10%	25V
C007	1-123-306-00	ELECT	47MF	20%	10V
C008	1-131-347-00	ELECT(SOLID)	1MF	10%	25V
C009	1-123-356-00	ELECT	10MF	20%	16V
C010	1-130-495-00	MYLAR	0.1MF	5%	50V
C011	1-131-347-00	ELECT(SOLID)	1MF	10%	25V
C012	1-161-013-00	CERAMIC	0.01MF	10%	25V
C013	1-102-977-00	CERAMIC	200PF	5%	50V
C014	1-123-356-00	ELECT	10MF	20%	16V
C015	1-102-516-00	CERAMIC	27PF	5%	50V
C016	1-102-852-00	CERAMIC	47PF	5%	50V
C017	1-123-307-00	ELECT	100MF	20%	6.3V
C018	1-161-059-00	CERAMIC	0.047MF	10%	25V
C019	1-161-025-00	CERAMIC	0.1MF	10%	25V
C020	1-123-307-00	ELECT	100MF	20%	6.3V
C021	1-161-013-00	CERAMIC	0.01MF	10%	25V
C022	1-102-529-00	CERAMIC	100PF	5%	50V
C023	1-102-824-00	CERAMIC	470PF	5%	50V
C024	1-161-013-00	CERAMIC	0.01MF	10%	25V
C025	1-102-074-00	CERAMIC	0.001MF	10%	50V
C026	1-101-004-00	CERAMIC	0.01MF		50V
C027	1-102-513-00	CERAMIC	18PF	5%	50V
C028	1-102-513-00	CERAMIC	18PF	5%	50V
C030	1-102-865-00	CERAMIC	8PF	0.5PF	50V
C031	1-161-059-00	CERAMIC	0.047MF	10%	25V
C032	1-161-013-00	CERAMIC	0.01MF	10%	25V
C033	1-102-978-00	CERAMIC	220PF	5%	50V
C034	1-123-380-00	ELECT	1MF	20%	50V
C035	1-101-004-00	CERAMIC	0.01MF		50V
C036	1-161-059-00	CERAMIC	0.047MF	10%	25V
C038	1-123-306-00	ELECT	47MF	20%	10V
C039	1-101-004-00	CERAMIC	0.01MF		50V
C041	1-161-059-00	CERAMIC	0.047MF	10%	25V
C042	1-161-059-00	CERAMIC	0.047MF	10%	25V
C043	1-123-356-00	ELECT	10MF	20%	16V
C044	1-161-059-00	CERAMIC	0.047MF	10%	25V
C045	1-101-004-00	CERAMIC	0.01MF		50V
C046	1-101-004-00	CERAMIC	0.01MF		50V
C047	1-102-947-00	CERAMIC	10PF	5%	50V
C048	1-102-518-00	CERAMIC	33PF	5%	50V
C049	1-161-059-00	CERAMIC	0.047MF	10%	25V
C050	1-123-380-00	ELECT	1MF	20%	50V
C051	1-161-059-00	CERAMIC	0.047MF	10%	25V
C052	1-161-059-00	CERAMIC	0.047MF	10%	25V
C053	1-102-530-00	CERAMIC	120PF	5%	50V
C054	1-161-059-00	CERAMIC	0.047MF	10%	25V
C055	1-123-356-00	ELECT	10MF	20%	16V
C056	1-161-059-00	CERAMIC	0.047MF	10%	25V
C057	1-161-013-00	CERAMIC	0.01MF	10%	25V
C058	1-123-356-00	ELECT	10MF	20%	16V
C059	1-161-059-00	CERAMIC	0.047MF	10%	25V
C060	1-102-978-00	CERAMIC	220PF	5%	50V
C061	1-123-380-00	ELECT	1MF	20%	50V
C062	1-123-356-00	ELECT	10MF	20%	16V
C063	1-123-330-00	ELECT	22MF	20%	16V
C064	1-123-356-00	ELECT	10MF	20%	16V
C065	1-130-495-00	MYLAR	0.1MF	5%	50V
C066	1-102-513-00	CERAMIC	18PF	5%	50V
C067	1-123-380-00	ELECT	1MF	20%	50V
C068	1-161-013-00	CERAMIC	0.01MF	10%	25V
C069	1-123-356-00	ELECT	10MF	20%	16V
C070	1-101-004-00	CERAMIC	0.01MF		50V
C071	1-101-004-00	CERAMIC	0.01MF		50V
C072	1-161-013-00	CERAMIC	0.01MF	10%	25V
C073	1-123-356-00	ELECT	10MF	20%	16V
C074	1-102-973-00	CERAMIC	100PF	5%	50V
C075	1-102-120-00	CERAMIC	0.0018MF	10%	50V
C076	1-161-013-00	CERAMIC	0.01MF	10%	25V
C078	1-123-356-00	ELECT	10MF	20%	16V

RP-41

Ref.No	Part No.	Description				Remark
C079	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C081	1-102-852-00	CERAMIC	47PF	5%	50V	
C082	1-123-369-00	ELECT	4.7MF	20%	50V	
C083	1-161-025-00	CERAMIC	0.1MF	10%	25V	
C084	1-161-025-00	CERAMIC	0.1MF	10%	25V	
		CONNECTOR				
CN001	*1-560-900-00	PIN, CONNECTOR 12P				
CN002	*1-560-894-00	PIN, CONNECTOR 6P				
CN003	*1-564-028-00	PIN, CONNECTOR 3P				
CN004	*1-508-736-21	PIN, CONNECTOR				
CN005	*1-564-030-00	PIN, CONNECTOR 5P				
		DIODE				
D001	8-719-911-19	DIODE 1SS119				
D002	8-719-911-19	DIODE 1SS119				
D003	8-719-100-35	DIODE RD5.6EB2				
D004	8-719-911-19	DIODE 1SS119				
D005	8-719-911-19	DIODE 1SS119				
D006	8-719-911-19	DIODE 1SS119				
		IC				
IC001	8-752-004-50	IC CX20045				
IC002	8-759-200-60	IC TA7060AP				
IC003	8-759-103-17	IC UPC1521HA				
IC004	8-752-006-10	IC CX20061				
		COIL				
L001	1-408-403-00	MICRO INDUCTOR 3.3UH				
L002	1-408-427-00	MICRO INDUCTOR 330UH				
L003	1-408-877-00	MICRO INDUCTOR 0.22UH				
L004	1-408-427-00	MICRO INDUCTOR 330UH				
L005	1-408-878-00	MICRO INDUCTOR 0.33UH				
L006	1-408-429-00	MICRO INDUCTOR 470UH				
L007	1-408-402-00	MICRO INDUCTOR 2.7UH				
L008	1-408-429-00	MICRO INDUCTOR 470UH				
L009	1-408-411-00	MICRO INDUCTOR 15UH				
L010	1-408-429-00	MICRO INDUCTOR 470UH				
L011	1-408-411-00	MICRO INDUCTOR 15UH				
L012	1-408-421-00	MICRO INDUCTOR 100UH				
L013	1-408-422-00	MICRO INDUCTOR 120UH				
L014	1-408-412-00	MICRO INDUCTOR 18UH				
L015	1-408-415-00	MICRO INDUCTOR 33UH				
L016	1-410-162-11	MICRO INDUCTOR 470UH				
L017	1-408-408-00	MICRO INDUCTOR 8.2UH				
L018	1-408-417-00	MICRO INDUCTOR 47UH				
L019	1-410-093-11	MICRO INDUCTOR 33MMH				
L020	1-408-429-00	MICRO INDUCTOR 470UH				
L021	1-408-429-00	MICRO INDUCTOR 470UH				
L022	1-408-429-00	MICRO INDUCTOR 470UH				
L023	1-408-411-00	MICRO INDUCTOR 15UH				
L024	1-408-429-00	MICRO INDUCTOR 470UH				
L025	1-408-429-00	MICRO INDUCTOR 470UH				
		TRANSISTOR				
Q001	8-729-603-30	TRANSISTOR 2SC403SP-3				
Q002	8-729-600-27	TRANSISTOR 2SC634SP				
Q003	8-729-177-33	TRANSISTOR 2SD773-4				
Q004	8-729-900-36	TRANSISTOR DTC124ES				
Q005	8-729-600-27	TRANSISTOR 2SC634SP				
Q006	8-729-600-27	TRANSISTOR 2SC634SP				
Q007	8-729-600-27	TRANSISTOR 2SC634SP				
Q008	8-729-600-27	TRANSISTOR 2SC634SP				
Q009	8-729-900-89	TRANSISTOR DTC144ES				
Q010	8-729-600-27	TRANSISTOR 2SC634SP				
Q011	8-729-600-27	TRANSISTOR 2SC634SP				
Q012	8-729-600-27	TRANSISTOR 2SC634SP				
Q013	8-729-900-80	TRANSISTOR DTC114ES				
Q014	8-729-600-27	TRANSISTOR 2SC634SP				
Q015	8-729-204-83	TRANSISTOR 2SA1048-GR				
Q016	8-729-204-83	TRANSISTOR 2SA1048-GR				
Q017	8-729-600-27	TRANSISTOR 2SC634SP				
Q018	8-729-600-27	TRANSISTOR 2SC634SP				
Q019	8-729-603-30	TRANSISTOR 2SC403SP-3				
Q020	8-729-900-36	TRANSISTOR DTC124ES				
Q021	8-729-900-63	TRANSISTOR DTA124ES				
Q022	8-729-900-89	TRANSISTOR DTC144ES				
Q023	8-729-600-27	TRANSISTOR 2SC634SP				
Q024	8-729-600-27	TRANSISTOR 2SC634SP				
Q025	8-729-600-27	TRANSISTOR 2SC634SP				
		RESISTOR				
R001	1-247-819-00	CARBON	330	5%	1/6W	
R002	1-247-819-00	CARBON	330	5%	1/6W	
R003	1-247-833-00	CARBON	1.2K	5%	1/6W	
R004	1-247-819-00	CARBON	330	5%	1/6W	
R005	1-249-417-11	CARBON	1K	5%	1/6W	
R006	1-249-417-11	CARBON	1K	5%	1/6W	
R007	1-247-821-00	CARBON	390	5%	1/6W	
R008	1-247-833-00	CARBON	1.2K	5%	1/6W	
R009	1-249-417-11	CARBON	1K	5%	1/6W	
R010	1-249-417-11	CARBON	1K	5%	1/6W	
R011	1-249-417-11	CARBON	1K	5%	1/6W	
R012	1-249-417-11	CARBON	1K	5%	1/6W	
R013	1-247-839-00	CARBON	2.2K	5%	1/6W	
R014	1-247-829-00	CARBON	820	5%	1/6W	
R015	1-249-433-11	CARBON	22K	5%	1/6W	
R016	1-247-829-00	CARBON	820	5%	1/6W	
R017	1-247-823-00	CARBON	470	5%	1/6W	
R018	1-247-823-00	CARBON	470	5%	1/6W	
R019	1-247-845-00	CARBON	3.9K	5%	1/6W	
R020	1-249-433-11	CARBON	22K	5%	1/6W	
R021	1-249-433-11	CARBON	22K	5%	1/6W	
R022	1-249-415-11	CARBON	680	5%	1/6W	
R023	1-247-797-00	CARBON	39	5%	1/6W	
R024	1-249-417-11	CARBON	1K	5%	1/6W	
R025	1-249-433-11	CARBON	22K	5%	1/6W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R026	1-249-433-11	CARBON	22K	5%	1/6W	
R027	1-249-433-11	CARBON	22K	5%	1/6W	
R028	1-249-414-11	CARBON	560	5%	1/6W	
R029	1-247-823-00	CARBON	470	5%	1/6W	
R030	1-247-817-00	CARBON	270	5%	1/6W	
R031	1-247-817-00	CARBON	270	5%	1/6W	
R032	1-249-434-11	CARBON	27K	5%	1/6W	
R033	1-247-859-00	CARBON	15K	5%	1/6W	
R034	1-249-417-11	CARBON	1K	5%	1/6W	
R035	1-249-429-11	CARBON	10K	5%	1/6W	
R036	1-249-429-11	CARBON	10K	5%	1/6W	
R037	1-215-433-00	METAL	3.3K	1%	1/6W	
R038	1-215-451-00	METAL	18K	1%	1/6W	
R040	1-215-433-00	METAL	3.3K	1%	1/6W	
R041	1-215-405-00	METAL	220	1%	1/6W	
R042	1-215-413-00	METAL	470	1%	1/6W	
R043	1-249-417-11	CARBON	1K	5%	1/6W	
R044	1-247-839-00	CARBON	2.2K	5%	1/6W	
R045	1-249-417-11	CARBON	1K	5%	1/6W	
R046	1-249-429-11	CARBON	10K	5%	1/6W	
R047	1-249-429-11	CARBON	10K	5%	1/6W	
R048	1-247-811-00	CARBON	150	5%	1/6W	
R049	1-249-417-11	CARBON	1K	5%	1/6W	
R050	1-247-829-00	CARBON	820	5%	1/6W	
R051	1-249-437-11	CARBON	47K	5%	1/6W	
R052	1-249-434-11	CARBON	27K	5%	1/6W	
R053	1-249-429-11	CARBON	10K	5%	1/6W	
R054	1-249-405-11	CARBON	100	5%	1/6W	
R055	1-249-441-11	CARBON	100K	5%	1/6W	
R056	1-247-895-00	CARBON	470K	5%	1/6W	
R057	1-249-429-11	CARBON	10K	5%	1/6W	
R058	1-249-429-11	CARBON	10K	5%	1/6W	
R059	1-247-815-00	CARBON	220	5%	1/6W	
R060	1-249-435-11	CARBON	33K	5%	1/6W	
R061	1-249-429-11	CARBON	10K	5%	1/6W	
R062	1-249-432-11	CARBON	18K	5%	1/6W	
R063	1-249-422-11	CARBON	2.7K	5%	1/6W	
R064	1-247-857-00	CARBON	12K	5%	1/6W	
R065	1-249-415-11	CARBON	680	5%	1/6W	
R066	1-247-870-00	CARBON	43K	5%	1/6W	
R067	1-249-405-11	CARBON	100	5%	1/6W	
R068	1-247-859-00	CARBON	15K	5%	1/6W	
R069	1-249-417-11	CARBON	1K	5%	1/6W	
R070	1-247-815-00	CARBON	220	5%	1/6W	
R071	1-249-417-11	CARBON	1K	5%	1/6W	
R072	1-249-433-11	CARBON	22K	5%	1/6W	
R073 ⚠	1-217-387-00	FUSIBLE	10	5%	1/4W	F
R074	1-249-417-11	CARBON	1K	5%	1/6W	
R075	1-247-857-00	CARBON	12K	5%	1/6W	
R076	1-249-417-11	CARBON	1K	5%	1/6W	
R079	1-247-858-00	CARBON	13K	5%	1/6W	
R082	1-249-422-11	CARBON	2.7K	5%	1/6W	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV001	1-228-920-00	RES, ADJ, CARBON 2.2K	
RV002	1-228-920-00	RES, ADJ, CARBON 2.2K	
RV003	1-228-920-00	RES, ADJ, CARBON 2.2K	
RV004	1-228-920-00	RES, ADJ, CARBON 2.2K	
RV005	1-228-919-00	RES, ADJ, CARBON 1K	
RV006	1-228-990-00	RES, ADJ, CARBON 1K	
RV007	1-228-920-00	RES, ADJ, CARBON 2.2K	
RV008	1-228-920-00	RES, ADJ, CARBON 2.2K	

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*A-6711-767-A VI-23 BOARD, COMPLETE
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CAPACITOR

Ref.No	Part No.	Description			Remark
C008	1-101-004-00	CERAMIC	0.01MF		50V
C010	1-101-004-00	CERAMIC	0.01MF		50V
C011	1-101-004-00	CERAMIC	0.01MF		50V
C012	1-161-055-00	CERAMIC	0.022MF	10%	25V
C013	1-102-822-00	CERAMIC	390PF	5%	50V
C014	1-101-004-00	CERAMIC	0.01MF		50V
C015	1-123-330-00	ELECT	22MF	20%	16V
C016	1-101-006-00	CERAMIC	0.047MF		50V
C017	1-101-004-00	CERAMIC	0.01MF		50V
C020	1-101-006-00	CERAMIC	0.047MF		50V
C021	1-131-377-00	TANTALUM	10MF	10%	10V
C022	1-131-377-00	TANTALUM	10MF	10%	10V
C023	1-161-024-00	CERAMIC	0.082MF	10%	25V
C024	1-101-004-00	CERAMIC	0.01MF		50V
C025	1-123-380-00	ELECT	1MF	20%	50V
C026	1-102-977-00	CERAMIC	200PF	5%	50V
C027	1-123-369-00	ELECT	4.7MF	20%	25V
C028	1-102-951-00	CERAMIC	15PF	5%	50V
C029	1-101-004-00	CERAMIC	0.01MF		50V
C030	1-101-004-00	CERAMIC	0.01MF		50V
C031	1-101-004-00	CERAMIC	0.01MF		50V
C032	1-123-380-00	ELECT	1MF	20%	50V
C033	1-102-525-00	CERAMIC	68PF	5%	50V
C034	1-102-525-00	CERAMIC	68PF	5%	50V
C035	1-102-128-00	CERAMIC	0.0082MF	10%	50V
C036	1-102-516-00	CERAMIC	27PF	5%	50V
C037	1-102-962-00	CERAMIC	30PF	5%	50V
C038	1-101-004-00	CERAMIC	0.01MF		50V
C039	1-123-369-00	ELECT	4.7MF	20%	25V
C040	1-101-004-00	CERAMIC	0.01MF		50V
C041	1-101-004-00	CERAMIC	0.01MF		50V
C042	1-102-525-00	CERAMIC	68PF	5%	50V
C043	1-102-525-00	CERAMIC	68PF	5%	50V
C044	1-102-521-00	CERAMIC	43PF	5%	50V
C045	1-123-306-00	ELECT	47MF	20%	10V
C046	1-101-004-00	CERAMIC	0.01MF		50V
C047	1-101-006-00	CERAMIC	0.047MF		50V

When indicating parts by reference number, please include the board name.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

VI-23

Ref.No	Part No.	Description			Remark
C048	1-102-816-00	CERAMIC	120PF	5%	50V
C049	1-123-382-00	ELECT	3.3MF	20%	50V
C050	1-130-483-00	MYLAR	0.01MF	5%	50V
C051	1-101-006-00	CERAMIC	0.047MF		50V
C052	1-123-306-00	ELECT	47MF	20%	10V
C053	1-101-004-00	CERAMIC	0.01MF		50V
C054	1-102-816-00	CERAMIC	120PF	5%	50V
C055	1-102-980-00	CERAMIC	270PF	5%	50V
C056	1-102-963-00	CERAMIC	33PF	5%	50V
C057	1-123-380-00	ELECT	1MF	20%	50V
C058	1-161-040-00	CERAMIC	0.0012MF	10%	25V
C059	1-123-380-00	ELECT	1MF	20%	50V
C060	1-101-004-00	CERAMIC	0.01MF		50V
C061	1-102-525-00	CERAMIC	68PF	5%	50V
C062	1-102-865-00	CERAMIC	8PF	0.5PF	50V
C063	1-102-525-00	CERAMIC	68PF	5%	50V
C065	1-101-004-00	CERAMIC	0.01MF		50V
C074	1-101-004-00	CERAMIC	0.01MF		50V
C084	1-101-004-00	CERAMIC	0.01MF		50V
C085	1-101-004-00	CERAMIC	0.01MF		50V
C086	1-101-004-00	CERAMIC	0.01MF		50V
C087	1-123-356-00	ELECT	10MF	20%	16V
C089	1-101-004-00	CERAMIC	0.01MF		50V
C090	1-102-816-00	CERAMIC	120PF	5%	50V
C091	1-101-004-00	CERAMIC	0.01MF		50V
C092	1-101-882-00	CERAMIC	51PF	5%	50V
C093	1-101-004-00	CERAMIC	0.01MF		50V
C094	1-102-816-00	CERAMIC	120PF	5%	50V
C095	1-101-004-00	CERAMIC	0.01MF		50V
C096	1-130-472-00	MYLAR	0.0012MF	5%	50V
C097	1-123-382-00	ELECT	3.3MF	20%	50V
C098	1-130-471-00	MYLAR	0.001MF	5%	50V
C099	1-161-045-00	CERAMIC	0.0033MF	10%	25V
C100	1-101-059-00	CERAMIC	510PF	5%	50V
C101	1-130-471-00	MYLAR	0.001MF	5%	50V
C102	1-130-047-00	FILM	180PF	5%	50V
C103	1-101-882-00	CERAMIC	51PF	5%	50V
C104	1-101-004-00	CERAMIC	0.01MF		50V
C105	1-123-330-00	ELECT	22MF	20%	16V
C106	1-101-006-00	CERAMIC	0.047MF		50V
C107	1-102-773-00	CERAMIC	330PF	5%	50V
C108	1-161-047-00	CERAMIC	0.0047MF	10%	25V
C109	1-101-006-00	CERAMIC	0.047MF		50V
C110	1-123-356-00	ELECT	10MF	20%	16V
C111	1-101-004-00	CERAMIC	0.01MF		50V
C112	1-161-045-00	CERAMIC	0.0033MF	10%	25V
C113	1-101-001-00	CERAMIC	0.001MF		50V
C114	1-123-333-00	ELECT	100MF	20%	16V
C115	1-161-025-00	CERAMIC	0.1MF	10%	25V
C116	1-123-325-00	ELECT	2200MF	20%	16V
C117	1-101-006-00	CERAMIC	0.047MF		50V
C118	1-102-865-00	CERAMIC	8PF	0.5PF	50V
C119	1-101-004-00	CERAMIC	0.01MF		50V
C121	1-102-822-00	CERAMIC	390PF	5%	50V
C122	1-161-057-00	CERAMIC	0.033MF	10%	25V
C123	1-101-004-00	CERAMIC	0.01MF		50V
C124	1-123-356-00	ELECT	10MF	20%	16V
C125	1-101-006-00	CERAMIC	0.047MF		50V
C126	1-101-004-00	CERAMIC	0.01MF		50V
C127	1-101-004-00	CERAMIC	0.01MF		50V
C128	1-101-004-00	CERAMIC	0.01MF		50V
C129	1-161-025-00	CERAMIC	0.1MF	10%	25V
C130	1-101-006-00	CERAMIC	0.047MF		50V
C131	1-101-006-00	CERAMIC	0.047MF		50V
C132	1-101-006-00	CERAMIC	0.047MF		50V
C133	1-102-976-00	CERAMIC	180PF	5%	50V
C134	1-102-824-00	CERAMIC	470PF	5%	50V
C135	1-102-823-00	CERAMIC	430PF	5%	50V
C136	1-102-820-00	CERAMIC	330PF	5%	50V
C137	1-101-004-00	CERAMIC	0.01MF		50V
C138	1-101-004-00	CERAMIC	0.01MF		50V
C139	1-161-013-00	CERAMIC	0.01MF	10%	25V
C140	1-102-525-00	CERAMIC	68PF	5%	50V
C141	1-101-006-00	CERAMIC	0.047MF		50V
C142	1-102-508-00	CERAMIC	10PF	0.5PF	50V
C143	1-102-521-00	CERAMIC	43PF	5%	50V
C144	1-102-521-00	CERAMIC	43PF	5%	50V
C145	1-102-508-00	CERAMIC	10PF	0.5PF	50V
C146	1-123-330-00	ELECT	22MF	20%	16V
C147	1-102-904-00	CERAMIC	110PF	5%	50V
C148	1-102-515-00	CERAMIC	24PF	5%	50V
C149	1-102-525-00	CERAMIC	68PF	5%	50V
C150	1-123-330-00	ELECT	22MF	20%	16V
C151	1-123-330-00	ELECT	22MF	20%	16V
C152	1-101-004-00	CERAMIC	0.01MF		50V
C153	1-123-330-00	ELECT	22MF	20%	16V
C154	1-123-330-00	ELECT	22MF	20%	16V
C155	1-101-004-00	CERAMIC	0.01MF		50V
C156	1-101-004-00	CERAMIC	0.01MF		50V
C157	1-102-976-00	CERAMIC	180PF	5%	50V
C158	1-102-823-00	CERAMIC	430PF	5%	50V
C159	1-102-824-00	CERAMIC	470PF	5%	50V
C160	1-101-361-00	CERAMIC	150PF	5%	50V
C161	1-123-330-00	ELECT	22MF	20%	16V
C162	1-102-530-00	CERAMIC	120PF	5%	50V
C163	1-101-974-00	CERAMIC	20PF	5%	50V
C164	1-123-330-00	ELECT	22MF	20%	16V
C165	1-123-380-00	ELECT	1MF	20%	50V
C166	1-123-380-00	ELECT	1MF	20%	50V
C167	1-123-380-00	ELECT	1MF	20%	50V
C168	1-123-380-00	ELECT	1MF	20%	50V
C169	1-123-381-00	ELECT	2.2MF	20%	50V
C170	1-123-318-00	ELECT	33MF	20%	16V
C171	1-101-005-00	CERAMIC	0.022MF		50V
C172	1-101-001-00	CERAMIC	0.001MF		50V
C173	1-101-001-00	CERAMIC	0.001MF		50V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
C174	1-101-004-00	CERAMIC	0.01MF		50V
C175	1-123-330-00	ELECT	22MF	20%	16V
C176	1-123-330-00	ELECT	22MF	20%	16V
C177	1-102-962-00	CERAMIC	30PF	5%	50V
C178	1-101-888-00	CERAMIC	68PF	5%	50V
C179	1-123-381-00	ELECT	2.2MF	20%	50V
C180	1-102-936-00	CERAMIC	3PF	0.25PF	50V
C181	1-101-006-00	CERAMIC	0.047MF		50V
C182	1-123-369-00	ELECT	4.7MF	20%	25V
C183	1-123-356-00	ELECT	10MF	20%	16V
C184	1-101-884-00	CERAMIC	56PF	5%	50V
C185	1-102-965-00	CERAMIC	39PF	5%	50V
C186	1-123-356-00	ELECT	10MF	20%	16V
C187	1-123-356-00	ELECT	10MF	20%	16V
C189	1-102-973-00	CERAMIC	100PF	5%	50V
C190	1-123-330-00	ELECT	22MF	20%	16V
C191	1-102-977-00	CERAMIC	200PF	5%	50V
C192	1-102-973-00	CERAMIC	100PF	5%	50V
C193	1-130-471-00	MYLAR	0.001MF	5%	50V
C194	1-101-004-00	CERAMIC	0.01MF		50V
C195	1-123-356-00	ELECT	10MF	20%	16V
C196	1-123-356-00	ELECT	10MF	20%	16V
C197	1-161-025-00	CERAMIC	0.1MF	10%	25V
C198	1-102-816-00	CERAMIC	120PF	5%	50V
C199	1-101-004-00	CERAMIC	0.01MF		50V
C200	1-101-006-00	CERAMIC	0.047MF		50V
C201	1-102-973-00	CERAMIC	100PF	5%	50V
C202	1-101-004-00	CERAMIC	0.01MF		50V
C203	1-101-361-00	CERAMIC	150PF	5%	50V
C204	1-130-491-00	MYLAR	0.047MF	5%	50V
C205	1-161-043-00	CERAMIC	0.0022MF	10%	25V
C206	1-123-356-00	ELECT	10MF	20%	16V
C207	1-101-006-00	CERAMIC	0.047MF		50V
C208	1-123-369-00	ELECT	4.7MF	20%	25V
C209	1-123-380-00	ELECT	1MF	20%	50V
C210	1-123-356-00	ELECT	10MF	20%	16V
C211	1-123-330-00	ELECT	22MF	20%	16V
C212	1-123-356-00	ELECT	10MF	20%	16V
C213	1-123-330-00	ELECT	22MF	20%	16V
C214	1-123-318-00	ELECT	33MF	20%	16V
C215	1-102-948-00	CERAMIC	11PF	5%	50V
C216	1-101-004-00	CERAMIC	0.01MF		50V
C217	1-101-004-00	CERAMIC	0.01MF		50V
C218	1-101-004-00	CERAMIC	0.01MF		50V
C219	1-123-330-00	ELECT	22MF	20%	16V
C220	1-101-004-00	CERAMIC	0.01MF		50V
C221	1-101-004-00	CERAMIC	0.01MF		50V
C222	1-123-330-00	ELECT	22MF	20%	16V
C223	1-161-039-00	CERAMIC	0.001MF	10%	25V
C224	1-161-025-00	CERAMIC	0.1MF	10%	25V
		FILTER			
CF001	1-527-849-00	FILTER, CERAMIC			

Ref.No	Part No.	Description	Remark
CF002	1-527-875-00	FILTER, CERAMIC	
		CONNECTOR	
CN001	*1-560-893-00	PIN, CONNECTOR 5P	
CN002	*1-560-896-00	PIN, CONNECTOR 8P	
CN003	*1-560-891-00	PIN, CONNECTOR 3P	
CN004	*1-560-895-00	PIN, CONNECTOR 7P	
CN005	*1-560-894-00	PIN, CONNECTOR 6P	
CN006	*1-560-894-00	PIN, CONNECTOR 6P	
CN007	*1-560-899-00	PIN, CONNECTOR 11P	
		TRIMMER	
CV001	1-141-275-00	CAP, TRIMMER	
		DIODE	
D003	8-719-911-19	DIODE 1SS119	
D009	8-719-100-41	DIODE RD6.8EB2	
D010	8-719-911-19	DIODE 1SS119	
D011	8-719-911-19	DIODE 1SS119	
D012	8-719-911-19	DIODE 1SS119	
D013	8-719-000-12	DIODE MC931	
D014	8-719-911-19	DIODE 1SS119	
D015	8-719-911-19	DIODE 1SS119	
D016	8-719-911-19	DIODE 1SS119	
D017	8-719-911-19	DIODE 1SS119	
D018	8-719-911-19	DIODE 1SS119	
D019	8-719-911-19	DIODE 1SS119	
D020	8-719-911-19	DIODE 1SS119	
D021	8-719-911-19	DIODE 1SS119	
D022	8-719-911-19	DIODE 1SS119	
D023	8-719-911-19	DIODE 1SS119	
D024	8-719-911-19	DIODE 1SS119	
D025	8-719-911-19	DIODE 1SS119	
D026	8-719-911-19	DIODE 1SS119	
D027	8-719-901-33	DIODE 1SS133	
D028	8-719-901-33	DIODE 1SS133	
D029	8-719-911-19	DIODE 1SS119	
D030	8-719-911-19	DIODE 1SS119	
D031	8-719-911-19	DIODE 1SS119	
		DELAY LINE	
DL001	1-415-419-21	DELAY LINE	
DL002	1-415-313-00	DELAY LINE (1H)	
DL003	1-415-352-11	DELAY LINE, 1H	
		FILTER	
FL001	1-235-098-00	FILTER, BAND PASS	
FL002	1-235-097-00	FILTER, LOW PASS	
		IC	
IC001	8-759-203-99	IC CX10021B-NP	
IC006	8-759-202-47	IC CX10023A	

When indicating parts by reference number, please include the board name.

VI-23

Ref.No	Part No.	Description	Remark
IC007	8-759-045-38	IC MC14538BCP	
IC008	8-759-101-62	IC CX20043	
IC009	8-758-662-00	IC CX-866B	
		COIL	
L002	1-408-408-00	MICRO INDUCTOR 8.2UH	
L003	1-408-423-00	MICRO INDUCTOR 150UH	
L004	1-408-421-00	MICRO INDUCTOR 100UH	
L005	1-408-429-00	MICRO INDUCTOR 470UH	
L006	1-410-122-11	MICRO INDUCTOR 1.8MMH	
L007	1-408-427-00	MICRO INDUCTOR 330UH	
L008	1-408-415-00	MICRO INDUCTOR 33UH	
L009	1-408-426-00	MICRO INDUCTOR 270UH	
L010	1-408-407-00	MICRO INDUCTOR 6.8UH	
L011	1-408-406-00	MICRO INDUCTOR 5.6UH	
L012	1-407-496-00	MICRO INDUCTOR 2.2MMH	
L013	1-407-499-00	MICRO INDUCTOR 3.9MMH	
L014	1-408-421-00	MICRO INDUCTOR 100UH	
L016	1-408-429-00	MICRO INDUCTOR 470UH	
L017	1-408-415-00	MICRO INDUCTOR 33UH	
L018	1-408-423-00	MICRO INDUCTOR 150UH	
L019	1-408-409-00	MICRO INDUCTOR 10UH	
L020	1-408-421-00	MICRO INDUCTOR 100UH	
L021	1-408-422-00	MICRO INDUCTOR 120UH	
L022	1-408-421-00	MICRO INDUCTOR 100UH	
L023	1-408-414-00	MICRO INDUCTOR 27UH	
L024	1-408-417-00	MICRO INDUCTOR 47UH	
L025	1-408-423-00	MICRO INDUCTOR 150UH	
L026	1-408-409-00	MICRO INDUCTOR 10UH	
L027	1-408-415-00	MICRO INDUCTOR 33UH	
L028	1-408-419-00	MICRO INDUCTOR 68UH	
L029	1-408-397-00	MICRO INDUCTOR 1UH	
L030	1-408-397-00	MICRO INDUCTOR 1UH	
L032	1-408-409-00	MICRO INDUCTOR 10UH	
L033	1-408-422-00	MICRO INDUCTOR 120UH	
		VARIABLE COIL	
LV002	1-408-512-00	COIL (VARIABLE)	
		IC LINK	
PS001⚠	1-532-685-00	LINK, IC	
		TRANSISTOR	
Q006	8-729-600-27	TRANSISTOR 2SC634SP	
Q007	8-729-600-27	TRANSISTOR 2SC634SP	
Q008	8-729-600-27	TRANSISTOR 2SC634SP	
Q009	8-729-600-27	TRANSISTOR 2SC634SP	
Q012	8-729-600-27	TRANSISTOR 2SC634SP	
Q013	8-729-600-27	TRANSISTOR 2SC634SP	
Q014	8-729-600-27	TRANSISTOR 2SC634SP	
Q015	8-729-600-27	TRANSISTOR 2SC634SP	
Q016	8-729-900-36	TRANSISTOR DTC124ES	
Q017	8-729-204-83	TRANSISTOR 2SA1048-GR	

Ref.No	Part No.	Description	Remark
Q018	8-729-900-85	TRANSISTOR DTC144WS	
Q020	8-729-600-27	TRANSISTOR 2SC634SP	
Q023	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q024	8-729-600-27	TRANSISTOR 2SC634SP	
Q027	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q029	8-729-600-27	TRANSISTOR 2SC634SP	
Q031	8-729-900-65	TRANSISTOR DTA144ES	
Q032	8-729-900-89	TRANSISTOR DTC144ES	
Q033	8-729-900-85	TRANSISTOR DTC144WS	
Q034	8-729-177-44	TRANSISTOR 2SD774-5	
Q035	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q036	8-729-113-33	TRANSISTOR 2SB733-4	
Q037	8-729-600-27	TRANSISTOR 2SC634SP	
Q038	8-729-600-27	TRANSISTOR 2SC634SP	
Q039	8-729-600-27	TRANSISTOR 2SC634SP	
Q040	8-729-600-27	TRANSISTOR 2SC634SP	
Q041	8-729-900-89	TRANSISTOR DTC144ES	
Q042	8-729-900-89	TRANSISTOR DTC144ES	
Q043	8-729-600-27	TRANSISTOR 2SC634SP	
Q045	8-729-600-27	TRANSISTOR 2SC634SP	
Q046	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q047	8-729-384-46	TRANSISTOR 2SA844-C	
Q048	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q049	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q050	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q051	8-729-600-27	TRANSISTOR 2SC634SP	
Q052	8-729-384-46	TRANSISTOR 2SA844-C	
Q053	8-729-384-46	TRANSISTOR 2SA844-C	
Q054	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q055	8-729-600-27	TRANSISTOR 2SC634SP	
Q056	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q057	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q058	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q059	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q060	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q061	8-729-600-27	TRANSISTOR 2SC634SP	
Q062	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q063	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q064	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q065	8-729-600-27	TRANSISTOR 2SC634SP	
Q066	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q067	8-729-900-89	TRANSISTOR DTC144ES	
Q068	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q069	8-729-900-89	TRANSISTOR DTC144ES	
Q070	8-729-600-27	TRANSISTOR 2SC634SP	
Q071	8-729-900-89	TRANSISTOR DTC144ES	
Q072	8-729-900-89	TRANSISTOR DTC144ES	
Q074	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q075	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q076	8-729-900-89	TRANSISTOR DTC144ES	
Q077	8-729-900-89	TRANSISTOR DTC144ES	
Q078	8-729-900-89	TRANSISTOR DTC144ES	
Q079	8-729-384-46	TRANSISTOR 2SA844-C	

When indicating parts by reference number, please include the board name.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description				Remark
Q080	8-729-900-89	TRANSISTOR DTC144ES				
Q081	8-729-900-89	TRANSISTOR DTC144ES				
Q082	8-729-600-27	TRANSISTOR 2SC634SP				
		RESISTOR				
R019	1-249-433-11	CARBON	22K	5%	1/6W	
R020	1-249-423-11	CARBON	3.3K	5%	1/6W	
R021	1-249-425-11	CARBON	4.7K	5%	1/6W	
R022	1-247-821-00	CARBON	390	5%	1/6W	
R023	1-247-839-00	CARBON	2.2K	5%	1/6W	
R024	1-247-821-00	CARBON	390	5%	1/6W	
R025	1-247-821-00	CARBON	390	5%	1/6W	
R026	1-247-821-00	CARBON	390	5%	1/6W	
R027	1-247-821-00	CARBON	390	5%	1/6W	
R028	1-247-839-00	CARBON	2.2K	5%	1/6W	
R029	1-247-821-00	CARBON	390	5%	1/6W	
R030	1-247-839-00	CARBON	2.2K	5%	1/6W	
R031	1-249-417-11	CARBON	1K	5%	1/6W	
R032	1-249-417-11	CARBON	1K	5%	1/6W	
R033	1-249-434-11	CARBON	27K	5%	1/6W	
R034	1-247-857-00	CARBON	12K	5%	1/6W	
R035	1-247-839-00	CARBON	2.2K	5%	1/6W	
R038	1-249-417-11	CARBON	1K	5%	1/6W	
R039	1-247-839-00	CARBON	2.2K	5%	1/6W	
R040	1-249-423-11	CARBON	3.3K	5%	1/6W	
R041	1-249-435-11	CARBON	33K	5%	1/6W	
R042	1-249-422-11	CARBON	2.7K	5%	1/6W	
R043	1-249-440-11	CARBON	82K	5%	1/6W	
R044	1-247-887-00	CARBON	220K	5%	1/6W	
R045	1-247-829-00	CARBON	820	5%	1/6W	
R046	1-247-875-00	CARBON	68K	5%	1/6W	
R047	1-249-417-11	CARBON	1K	5%	1/6W	
R048	1-249-433-11	CARBON	22K	5%	1/6W	
R049	1-247-819-00	CARBON	330	5%	1/6W	
R050	1-249-417-11	CARBON	1K	5%	1/6W	
R051	1-249-419-11	CARBON	1.5K	5%	1/6W	
R052	1-249-419-11	CARBON	1.5K	5%	1/6W	
R053	1-247-823-00	CARBON	470	5%	1/6W	
R054	1-249-425-11	CARBON	4.7K	5%	1/6W	
R055	1-247-819-00	CARBON	330	5%	1/6W	
R056	1-247-819-00	CARBON	330	5%	1/6W	
R057	1-247-839-00	CARBON	2.2K	5%	1/6W	
R058	1-247-846-00	CARBON	4.3K	5%	1/6W	
R059	1-247-853-00	CARBON	8.2K	5%	1/6W	
R060	1-249-441-11	CARBON	100K	5%	1/6W	
R061	1-247-828-00	CARBON	750	5%	1/6W	
R062	1-249-423-11	CARBON	3.3K	5%	1/6W	
R063	1-249-437-11	CARBON	47K	5%	1/6W	
R064	1-247-892-00	CARBON	360K	5%	1/6W	
R065	1-247-894-00	CARBON	430K	5%	1/6W	
R066	1-249-423-11	CARBON	3.3K	5%	1/6W	
R067	1-249-423-11	CARBON	3.3K	5%	1/6W	
R068	1-249-437-11	CARBON	47K	5%	1/6W	

Ref.No	Part No.	Description				Remark
R070	1-247-851-00	CARBON	6.8K	5%	1/6W	
R072	1-247-878-00	CARBON	91K	5%	1/6W	
R073	1-249-423-11	CARBON	3.3K	5%	1/6W	
R074	1-247-851-00	CARBON	6.8K	5%	1/6W	
R075	1-249-435-11	CARBON	33K	5%	1/6W	
R076	1-247-887-00	CARBON	220K	5%	1/6W	
R077	1-247-839-00	CARBON	2.2K	5%	1/6W	
R078	1-247-824-00	CARBON	510	5%	1/6W	
R079	1-247-824-00	CARBON	510	5%	1/6W	
R080	1-247-829-00	CARBON	820	5%	1/6W	
R081	1-249-417-11	CARBON	1K	5%	1/6W	
R082	1-247-839-00	CARBON	2.2K	5%	1/6W	
R083	1-249-417-11	CARBON	1K	5%	1/6W	
R084	1-247-891-00	CARBON	330K	5%	1/6W	
R089	1-249-405-11	CARBON	100	5%	1/6W	
R093	1-249-437-11	CARBON	47K	5%	1/6W	
R094	1-247-853-00	CARBON	8.2K	5%	1/6W	
R096	1-249-429-11	CARBON	10K	5%	1/6W	
R097	1-249-423-11	CARBON	3.3K	5%	1/6W	
R109	1-247-819-00	CARBON	330	5%	1/6W	
R110	1-247-821-00	CARBON	390	5%	1/6W	
R111	1-247-853-00	CARBON	8.2K	5%	1/6W	
R113	1-247-819-00	CARBON	330	5%	1/6W	
R114	1-249-417-11	CARBON	1K	5%	1/6W	
R115	1-247-815-00	CARBON	220	5%	1/6W	
R116	1-249-417-11	CARBON	1K	5%	1/6W	
R117	1-249-422-11	CARBON	2.7K	5%	1/6W	
R118	1-247-851-00	CARBON	6.8K	5%	1/6W	
R119	1-249-417-11	CARBON	1K	5%	1/6W	
R120	1-247-889-00	CARBON	270K	5%	1/6W	
R121	1-249-417-11	CARBON	1K	5%	1/6W	
R122	1-247-870-00	CARBON	43K	5%	1/6W	
R123	1-247-838-00	CARBON	2K	5%	1/6W	
R124	1-247-862-00	CARBON	20K	5%	1/6W	
R125	1-247-848-00	CARBON	5.1K	5%	1/6W	
R126	1-249-429-11	CARBON	10K	5%	1/6W	
R128	1-249-433-11	CARBON	22K	5%	1/6W	
R129	1-247-873-00	CARBON	56K	5%	1/6W	
R130	1-249-435-11	CARBON	33K	5%	1/6W	
R132	1-249-425-11	CARBON	4.7K	5%	1/6W	
R133	1-249-423-11	CARBON	3.3K	5%	1/6W	
R134	1-249-425-11	CARBON	4.7K	5%	1/6W	
R136	1-247-851-00	CARBON	6.8K	5%	1/6W	
R137	1-249-429-11	CARBON	10K	5%	1/6W	
R138	1-249-420-11	CARBON	1.8K	5%	1/6W	
R139	1-247-859-00	CARBON	15K	5%	1/6W	
R140	1-249-417-11	CARBON	1K	5%	1/6W	
R141	1-247-857-00	CARBON	12K	5%	1/6W	
R142	1-249-422-11	CARBON	2.7K	5%	1/6W	
R143	1-247-839-00	CARBON	2.2K	5%	1/6W	
R144	1-249-417-11	CARBON	1K	5%	1/6W	
R145	1-249-429-11	CARBON	10K	5%	1/6W	
R146	1-249-405-11	CARBON	100	5%	1/6W	

When indicating parts by reference number, please include the board name.

VI-23

Ref.No	Part No.	Description				Remark
R147	1-247-839-00	CARBON	2.2K	5%	1/6W	
R148	1-247-839-00	CARBON	2.2K	5%	1/6W	
R149	1-249-429-11	CARBON	10K	5%	1/6W	
R150	1-247-803-00	CARBON	68	5%	1/6W	
R151	1-247-823-00	CARBON	470	5%	1/6W	
R153	1-249-405-11	CARBON	100	5%	1/6W	
R154	1-249-441-11	CARBON	100K	5%	1/6W	
R157	1-249-417-11	CARBON	1K	5%	1/6W	
R158	1-249-425-11	CARBON	4.7K	5%	1/6W	
R159	1-247-883-00	CARBON	150K	5%	1/6W	
R160	1-249-435-11	CARBON	33K	5%	1/6W	
R161	1-247-829-00	CARBON	820	5%	1/6W	
R162	1-249-435-11	CARBON	33K	5%	1/6W	
R163	1-247-839-00	CARBON	2.2K	5%	1/6W	
R164	1-249-434-11	CARBON	27K	5%	1/6W	
R165	1-247-857-00	CARBON	12K	5%	1/6W	
R166	1-247-815-00	CARBON	220	5%	1/6W	
R167	1-249-417-11	CARBON	1K	5%	1/6W	
R168	1-247-842-00	CARBON	3K	5%	1/6W	
R169	1-247-815-00	CARBON	220	5%	1/6W	
R170	1-249-425-11	CARBON	4.7K	5%	1/6W	
R171	1-247-833-00	CARBON	1.2K	5%	1/6W	
R172	1-249-425-11	CARBON	4.7K	5%	1/6W	
R173	1-249-422-11	CARBON	2.7K	5%	1/6W	
R174	1-249-429-11	CARBON	10K	5%	1/6W	
R175	1-247-824-00	CARBON	510	5%	1/6W	
R176	1-247-859-00	CARBON	15K	5%	1/6W	
R177	1-249-417-11	CARBON	1K	5%	1/6W	
R178	1-249-429-11	CARBON	10K	5%	1/6W	
R179	1-249-417-11	CARBON	1K	5%	1/6W	
R180	1-247-812-00	CARBON	160	5%	1/6W	
R181	1-249-433-11	CARBON	22K	5%	1/6W	
R182	1-249-433-11	CARBON	22K	5%	1/6W	
R183	1-247-819-00	CARBON	330	5%	1/6W	
R184	1-247-829-00	CARBON	820	5%	1/6W	
R185	1-247-839-00	CARBON	2.2K	5%	1/6W	
R186	1-247-821-00	CARBON	390	5%	1/6W	
R187	1-247-817-00	CARBON	270	5%	1/6W	
R188	1-249-405-11	CARBON	100	5%	1/6W	
R189	1-249-425-11	CARBON	4.7K	5%	1/6W	
R190	1-247-813-00	CARBON	180	5%	1/6W	
R191	1-249-420-11	CARBON	1.8K	5%	1/6W	
R192	1-247-815-00	CARBON	220	5%	1/6W	
R193	1-247-832-00	CARBON	1.1K	5%	1/6W	
R194	1-247-815-00	CARBON	220	5%	1/6W	
R195	1-247-840-00	CARBON	2.4K	5%	1/6W	
R196	1-247-857-00	CARBON	12K	5%	1/6W	
R197	1-247-839-00	CARBON	2.2K	5%	1/6W	
R198	1-215-445-00	METAL	10K	1%	1/6W	
R199	1-249-429-11	CARBON	10K	5%	1/6W	
R200	1-215-433-00	METAL	3.3K	1%	1/6W	
R201	1-249-417-11	CARBON	1K	5%	1/6W	
R202	1-247-833-00	CARBON	1.2K	5%	1/6W	
R203	1-247-875-00	CARBON	68K	5%	1/6W	
R204	1-249-405-11	CARBON	100	5%	1/6W	
R205	1-249-420-11	CARBON	1.8K	5%	1/6W	
R206	1-249-420-11	CARBON	1.8K	5%	1/6W	
R207	1-247-849-00	CARBON	5.6K	5%	1/6W	
R208	1-247-873-00	CARBON	56K	5%	1/6W	
R209	1-249-434-11	CARBON	27K	5%	1/6W	
R210	1-249-417-11	CARBON	1K	5%	1/6W	
R211	1-249-417-11	CARBON	1K	5%	1/6W	
R212	1-249-417-11	CARBON	1K	5%	1/6W	
R213	1-249-417-11	CARBON	1K	5%	1/6W	
R214	1-249-417-11	CARBON	1K	5%	1/6W	
R215	1-249-417-11	CARBON	1K	5%	1/6W	
R216	1-249-433-11	CARBON	22K	5%	1/6W	
R217	1-249-440-11	CARBON	82K	5%	1/6W	
R218	1-247-819-00	CARBON	330	5%	1/6W	
R219	1-249-419-11	CARBON	1.5K	5%	1/6W	
R220	1-247-811-00	CARBON	150	5%	1/6W	
R221	1-247-819-00	CARBON	330	5%	1/6W	
R222	1-249-440-11	CARBON	82K	5%	1/6W	
R223	1-249-433-11	CARBON	22K	5%	1/6W	
R224	1-247-873-00	CARBON	56K	5%	1/6W	
R225	1-247-873-00	CARBON	56K	5%	1/6W	
R226	1-247-839-00	CARBON	2.2K	5%	1/6W	
R227	1-247-857-00	CARBON	12K	5%	1/6W	
R228	1-247-839-00	CARBON	2.2K	5%	1/6W	
R229	1-247-819-00	CARBON	330	5%	1/6W	
R230	1-249-420-11	CARBON	1.8K	5%	1/6W	
R231	1-249-417-11	CARBON	1K	5%	1/6W	
R232	1-247-819-00	CARBON	330	5%	1/6W	
R233	1-249-405-11	CARBON	100	5%	1/6W	
R234	1-247-821-00	CARBON	390	5%	1/6W	
R235	1-247-839-00	CARBON	2.2K	5%	1/6W	
R236	1-249-433-11	CARBON	22K	5%	1/6W	
R237	1-249-433-11	CARBON	22K	5%	1/6W	
R238	1-247-829-00	CARBON	820	5%	1/6W	
R239	1-247-812-00	CARBON	160	5%	1/6W	
R240	1-247-817-00	CARBON	270	5%	1/6W	
R241	1-247-813-00	CARBON	180	5%	1/6W	
R242	1-247-819-00	CARBON	330	5%	1/6W	
R243	1-249-429-11	CARBON	10K	5%	1/6W	
R244	1-249-417-11	CARBON	1K	5%	1/6W	
R245	1-249-437-11	CARBON	47K	5%	1/6W	
R246	1-249-435-11	CARBON	33K	5%	1/6W	
R247	1-249-414-11	CARBON	560	5%	1/6W	
R248	1-249-414-11	CARBON	560	5%	1/6W	
R249	1-249-425-11	CARBON	4.7K	5%	1/6W	
R250	1-249-414-11	CARBON	560	5%	1/6W	
R251	1-247-839-00	CARBON	2.2K	5%	1/6W	
R252	1-249-405-11	CARBON	100	5%	1/6W	
R253	1-249-425-11	CARBON	4.7K	5%	1/6W	
R254	1-247-890-00	CARBON	300K	5%	1/6W	
R255	1-249-432-11	CARBON	18K	5%	1/6W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R256	1-249-435-11	CARBON	33K	5%	1/6W	
R257	1-249-414-11	CARBON	560	5%	1/6W	
R258	1-247-813-00	CARBON	180	5%	1/6W	
R259	1-247-813-00	CARBON	180	5%	1/6W	
R260	1-249-433-11	CARBON	22K	5%	1/6W	
R261	1-249-434-11	CARBON	27K	5%	1/6W	
R262	1-247-806-00	CARBON	91	5%	1/6W	
R263	1-249-437-11	CARBON	47K	5%	1/6W	
R264	1-249-435-11	CARBON	33K	5%	1/6W	
R265	1-247-797-00	CARBON	39	5%	1/6W	
R266	1-249-417-11	CARBON	1K	5%	1/6W	
R267	1-247-832-00	CARBON	1.1K	5%	1/6W	
R268	1-247-832-00	CARBON	1.1K	5%	1/6W	
R269	1-247-849-00	CARBON	5.6K	5%	1/6W	
R270	1-247-846-00	CARBON	4.3K	5%	1/6W	
R271	1-249-417-11	CARBON	1K	5%	1/6W	
R272	1-247-853-00	CARBON	8.2K	5%	1/6W	
R273	1-249-425-11	CARBON	4.7K	5%	1/6W	
R274	1-247-829-00	CARBON	820	5%	1/6W	
R275	1-249-417-11	CARBON	1K	5%	1/6W	
R276	1-249-437-11	CARBON	47K	5%	1/6W	
R277	1-249-435-11	CARBON	33K	5%	1/6W	
R278	1-249-417-11	CARBON	1K	5%	1/6W	
R280	1-249-417-11	CARBON	1K	5%	1/6W	
R281	1-249-414-11	CARBON	560	5%	1/6W	
R282	1-249-417-11	CARBON	1K	5%	1/6W	
R283	1-249-417-11	CARBON	1K	5%	1/6W	
R284	1-249-415-11	CARBON	680	5%	1/6W	
R285	1-247-901-00	CARBON	820K	5%	1/6W	
R286	1-249-429-11	CARBON	10K	5%	1/6W	
R287	1-247-839-00	CARBON	2.2K	5%	1/6W	
R288	1-249-432-11	CARBON	18K	5%	1/6W	
R289	1-247-839-00	CARBON	2.2K	5%	1/6W	
R290	1-249-417-11	CARBON	1K	5%	1/6W	
R291	1-249-417-11	CARBON	1K	5%	1/6W	
R292	1-247-839-00	CARBON	2.2K	5%	1/6W	
R293	1-249-419-11	CARBON	1.5K	5%	1/6W	
R294	1-249-423-11	CARBON	3.3K	5%	1/6W	
R295	1-247-852-00	CARBON	7.5K	5%	1/6W	
R296	1-247-857-00	CARBON	12K	5%	1/6W	
R297	1-249-429-11	CARBON	10K	5%	1/6W	
R298	1-247-849-00	CARBON	5.6K	5%	1/6W	
R299	1-249-437-11	CARBON	47K	5%	1/6W	
R300	1-247-883-00	CARBON	150K	5%	1/6W	
R301	1-247-903-00	CARBON	1M	5%	1/6W	
R302	1-249-417-11	CARBON	1K	5%	1/6W	
R303	1-249-405-11	CARBON	100	5%	1/6W	
R304	1-247-830-00	CARBON	910	5%	1/6W	
R305	1-249-423-11	CARBON	3.3K	5%	1/6W	
R306	1-247-899-00	CARBON	680K	5%	1/6W	
R307	1-247-839-00	CARBON	2.2K	5%	1/6W	
R308	1-249-415-11	CARBON	680	5%	1/6W	
R309	1-249-419-11	CARBON	1.5K	5%	1/6W	

Ref.No	Part No.	Description				Remark
R310	1-249-415-11	CARBON	680	5%	1/6W	
R312	1-249-435-11	CARBON	33K	5%	1/6W	
R313	1-249-423-11	CARBON	3.3K	5%	1/6W	
R314	1-247-810-00	CARBON	130	5%	1/6W	
R315	⚠1-217-387-00	FUSIBLE	10	5%	1/4W	F
R316	1-249-414-11	CARBON	560	5%	1/6W	
R317	1-247-833-00	CARBON	1.2K	5%	1/6W	

VARIABLE RESISTOR

RV001	1-228-989-00	RES, ADJ, CARBON 470
RV002	1-228-991-00	RES, ADJ, CARBON 2.2K
RV003	1-228-995-00	RES, ADJ, CARBON 22K
RV004	1-228-996-00	RES, ADJ, CARBON 47K
RV005	1-228-990-00	RES, ADJ, METAL GLAZE 1K
RV006	1-228-996-00	RES, ADJ, CARBON 47K
RV008	1-228-994-00	RES, ADJ, CARBON 10K
RV009	1-228-996-00	RES, ADJ, CARBON 47K
RV010	1-228-996-00	RES, ADJ, CARBON 47K
RV011	1-228-994-00	RES, ADJ, CARBON 10K
RV012	1-228-995-00	RES, ADJ, CARBON 22K
RV013	1-228-989-00	RES, ADJ, METAL GLAZE 470
RV014	1-228-990-00	RES, ADJ, CARBON 1K
RV015	1-228-990-00	RES, ADJ, CARBON 1K
RV016	1-228-993-00	RES, ADJ, METAL GLAZE 4.7K
RV017	1-228-994-00	RES, ADJ, METAL GLAZE 10K
RV018	1-228-996-00	RES, ADJ, CARBON 47K
RV019	1-228-993-00	RES, ADJ, METAL GLAZE 4.7K
RV020	1-228-994-00	RES, ADJ, CARBON 10K
RV021	1-228-996-00	RES, ADJ, CARBON 47K
RV022	1-228-994-00	RES, ADJ, CARBON 10K
RV023	1-228-995-00	RES, ADJ, CARBON 22K

TRANSFORMER

T001	1-426-093-00	COIL, REC C BPT

CRYSTAL

X001	1-567-504-11	OSCILLATOR, CRYSTAL

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*A-6713-266-A AU-26 BOARD, COMPLETE
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CAPACITOR

C001	1-130-478-00	MYLAR	0.0039MF	5%	50V
C002	1-123-380-00	ELECT	1MF	20%	50V
C003	1-124-473-11	ELECT	1000MF	20%	10V
C004	1-123-307-00	ELECT	100MF	20%	10V
C005	1-123-356-00	ELECT	10MF	20%	16V
C006	1-123-306-00	ELECT	47MF	20%	10V
C007	1-161-013-00	CERAMIC	0.01MF	10%	25V
C008	1-123-307-00	ELECT	100MF	20%	10V
C009	1-161-013-00	CERAMIC	0.01MF	10%	25V
C010	1-123-356-00	ELECT	10MF	20%	16V

When indicating parts by reference number, please include the board name.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

AU-26

Ref.No	Part No.	Description			Remark
C011	1-123-356-00	ELECT	10MF	20%	16V
C012	1-123-356-00	ELECT	10MF	20%	16V
C013	1-123-306-00	ELECT	47MF	20%	10V
C014	1-161-013-00	CERAMIC	0.01MF	10%	25V
C015	1-102-961-00	CERAMIC	27PF	10%	50V
C016	1-102-978-00	CERAMIC	220PF	5%	50V
C901	1-123-306-00	ELECT	47MF	20%	10V
C902	1-123-306-00	ELECT	47MF	20%	10V
C904	1-123-369-00	ELECT	4.7MF	20%	25V
C905	1-130-473-00	MYLAR	0.0015MF	5%	50V
C907	1-130-482-00	MYLAR	0.0082MF	5%	50V
C908	1-123-381-00	ELECT	2.2MF	20%	50V
C909	1-123-307-00	ELECT	100MF	20%	10V
C911	1-123-306-00	ELECT	47MF	20%	10V
C912	1-123-356-00	ELECT	10MF	20%	16V
C913	1-123-306-00	ELECT	47MF	20%	10V
C914	1-123-330-00	ELECT	22MF	20%	16V
C915	1-130-481-00	MYLAR	0.0068MF	5%	50V
C917	1-123-379-00	ELECT	0.47MF	20%	50V
C918	1-123-356-00	ELECT	10MF	20%	16V
C919	1-123-380-00	ELECT	1MF	20%	50V
C921	1-102-980-00	CERAMIC	270PF	5%	50V
C922	1-123-822-00	ELECT	47MF	20%	10V
C923	1-130-474-00	MYLAR	0.0018MF	5%	50V
C925	1-107-171-00	MICA	120PF	5%	500V
C927	1-123-822-00	ELECT	47MF	20%	10V
C928	1-130-479-00	MYLAR	0.0047MF	5%	50V
C929	1-130-477-00	MYLAR	0.0033MF	5%	50V
C930	1-136-051-00	FILM	0.0039MF	10%	630V
C933	1-161-013-00	CERAMIC	0.01MF	10%	25V

CONNECTOR

Ref.No	Part No.	Description
CN901	*1-560-893-00	PIN, CONNECTOR 5P
CN902	*1-508-796-00	PIN, CONNECTOR 2P
CN903	*1-560-894-00	PIN, CONNECTOR 6P
CN905	*1-560-891-00	PIN, CONNECTOR 3P
CN906	*1-560-892-00	PIN, CONNECTOR 4P

JACK

Ref.No	Part No.	Description
CNJ001	1-507-944-11	JACK, PIN (4 GANG) (VIDEO/AUDIO IN/OUT)

DIODE

Ref.No	Part No.	Description
D001	8-719-911-19	DIODE 1SS119
D002	8-719-911-19	DIODE 1SS119
D003	8-719-100-57	DIODE RD10EB2
D004	8-719-100-57	DIODE RD10EB2
D005	8-719-911-19	DIODE 1SS119
D901	8-719-000-06	DIODE MC921

IC

Ref.No	Part No.	Description
IC001	8-752-006-10	IC CX20061
IC002	8-752-006-10	IC CX20061
IC901	8-759-101-73	IC UPC1513HA
IC902	8-759-802-11	IC LA7091

COIL

Ref.No	Part No.	Description
L901	1-407-508-00	MICRO INDUCTOR 22MMH
L902	1-407-510-00	MICRO INDUCTOR 33MMH
L903	1-410-120-11	MICRO INDUCTOR 1.2MMH

TRANSISTOR

Ref.No	Part No.	Description
Q001	8-729-600-27	TRANSISTOR 2SC634SP
Q002	8-729-117-54	TRANSISTOR 2SA1175
Q003	8-729-600-27	TRANSISTOR 2SC634SP
Q004	8-729-117-54	TRANSISTOR 2SA1175
Q005	8-729-117-54	TRANSISTOR 2SA1175
Q006	8-729-600-27	TRANSISTOR 2SC634SP
Q008	8-729-600-27	TRANSISTOR 2SC634SP
Q010	8-729-600-27	TRANSISTOR 2SC634SP
Q902	8-729-900-89	TRANSISTOR DTC144ES
Q904	8-729-177-44	TRANSISTOR 2SD774-5
Q906	8-729-965-22	TRANSISTOR 2SC1652

RESISTOR

Ref.No	Part No.	Description			Remark
R001	1-249-441-11	CARBON	100K	5%	1/6W
R002	1-249-429-11	CARBON	10K	5%	1/6W
R003	1-247-851-00	CARBON	6.8K	5%	1/6W
R004	1-249-441-11	CARBON	100K	5%	1/6W
R005	1-249-437-11	CARBON	47K	5%	1/6W
R006	1-249-437-11	CARBON	47K	5%	1/6W
R007	1-247-803-00	CARBON	68	5%	1/6W
R008	1-247-803-00	CARBON	68	5%	1/6W
R009	1-247-803-00	CARBON	68	5%	1/6W
R010	1-249-417-11	CARBON	1K	5%	1/6W
R012	1-247-857-00	CARBON	12K	5%	1/6W
R013	1-249-429-11	CARBON	10K	5%	1/6W
R014	1-247-803-00	CARBON	68	5%	1/6W
R015	1-249-420-11	CARBON	1.8K	5%	1/6W
R016	1-249-429-11	CARBON	10K	5%	1/6W
R017	1-249-429-11	CARBON	10K	5%	1/6W
R018	1-249-435-11	CARBON	33K	5%	1/6W
R019	1-249-405-11	CARBON	100	5%	1/6W
R020	1-247-839-00	CARBON	2.2K	5%	1/6W
R021	1-249-405-11	CARBON	100	5%	1/6W
R022 ⚠	1-217-385-00	FUSIBLE	6.8	5%	1/4W F
R027	1-247-839-00	CARBON	2.2K	5%	1/6W
R903	1-247-885-00	CARBON	180K	5%	1/6W
R904	1-249-432-11	CARBON	18K	5%	1/6W
R905	1-247-821-00	CARBON	390	5%	1/6W
R908	1-249-417-11	CARBON	1K	5%	1/6W
R909	1-247-869-00	CARBON	39K	5%	1/6W
R910	1-249-435-11	CARBON	33K	5%	1/6W
R911	1-247-899-00	CARBON	680K	5%	1/6W
R912	1-247-829-00	CARBON	820	5%	1/6W
R913	1-249-432-11	CARBON	18K	5%	1/6W

When indicating parts by reference number, please include the board name.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description				Remark
R914	1-249-429-11	CARBON	10K	5%	1/6W	
R915	1-247-783-00	CARBON	10	5%	1/6W	
R916	1-247-859-00	CARBON	15K	5%	1/6W	
R919	1-247-839-00	CARBON	2.2K	5%	1/6W	
R920	1-249-429-11	CARBON	10K	5%	1/6W	
R924	1-249-417-11	CARBON	1K	5%	1/6W	
R925	1-247-204-00	CARBON	33	5%	1/2W	
R926	1-247-859-00	CARBON	15K	5%	1/6W	
R927	1-249-453-11	CARBON	3.3	5%	1/4W	
R929	1-247-839-00	CARBON	2.2K	5%	1/6W	
R930	1-249-417-11	CARBON	1K	5%	1/6W	
R931	1-249-422-11	CARBON	2.7K	5%	1/6W	
R932	1-247-849-00	CARBON	5.6K	5%	1/6W	
R940	1-249-433-11	CARBON	22K	5%	1/6W	

VARIABLE RESISTOR

RV902 1-228-998-00 RES, ADJ, CARBON 220K

TRANSFORMER

T900 1-433-237-00 TRANSFORMER, OSCILLATOR

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*A-6715-332-A ST-12 BOARD, COMPLETE
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*1-555-005-00 CABLE, P-P
*3-710-595-01 COVER (P), JACK

CAPACITOR

Ref.No	Part No.	Description				Remark
C001	1-124-272-00	ELECT	2.2MF	20%	50V	
C002	1-130-491-00	MYLAR	0.047MF	5%	50V	
C003	1-130-491-00	MYLAR	0.047MF	5%	50V	
C004	1-130-491-00	MYLAR	0.047MF	5%	50V	
C005	1-130-491-00	MYLAR	0.047MF	5%	50V	
C006	1-130-491-00	MYLAR	0.047MF	5%	50V	
C007	1-130-483-00	MYLAR	0.01MF	5%	50V	
C008	1-130-483-00	MYLAR	0.01MF	5%	50V	
C009	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C010	1-123-356-00	ELECT	10MF	20%	16V	
C011	1-161-039-00	CERAMIC	0.001MF	10%	25V	
C012	1-123-356-00	ELECT	10MF	20%	16V	
C013	1-161-039-00	CERAMIC	0.001MF	10%	25V	
C014	1-123-332-00	ELECT	47MF	20%	16V	
C016	1-131-347-00	ELECT(SOLID)	1MF	10%	25V	
C021	1-130-487-00	MYLAR	0.022MF	5%	50V	
C022	1-130-491-00	MYLAR	0.047MF	5%	50V	
C023	1-123-298-00	ELECT	470MF	20%	6.3V	
C024	1-123-380-00	ELECT	1MF	20%	50V	
C025	1-130-497-00	MYLAR	0.15MF	5%	50V	
C026	1-130-491-00	MYLAR	0.047MF	5%	50V	
C027	1-130-491-00	MYLAR	0.047MF	5%	50V	
C029	1-161-039-00	CERAMIC	0.001MF	10%	25V	
C030	1-131-345-00	ELECT(SOLID)	0.47MF	10%	25V	
C032	1-124-271-00	ELECT	1MF	20%	50V	
C033	1-161-043-00	CERAMIC	0.0022MF	10%	25V	
C034	1-124-290-00	ELECT	47MF	20%	10V	
C035	1-123-333-00	ELECT	100MF	20%	16V	
C301	1-125-299-00	DUBLE LAYERS	47000MF		5.5V	
C302	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C303	1-102-947-00	CERAMIC	10PF	5%	50V	
C305	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C306	1-123-373-00	ELECT	47MF	20%	63V	
C307	1-123-374-00	ELECT	100MF	20%	63V	
C308	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C309	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C310	1-123-380-00	ELECT	1MF	20%	50V	
C401	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C402	1-123-298-00	ELECT	470MF	20%	6.3V	
C403	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C404	1-136-298-00	FILM	0.0033MF	5%	100V	
C405	1-136-298-00	FILM	0.0033MF	5%	100V	
C406	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C407	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C408	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C409	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C410	1-123-382-00	ELECT	3.3MF	20%	50V	
C411	1-123-382-00	ELECT	3.3MF	20%	50V	
C412	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C413	1-123-318-00	ELECT	33MF	20%	16V	
C414	1-123-381-00	ELECT	2.2MF	20%	50V	
C450	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C470	1-123-323-00	ELECT	470MF	20%	16V	
C471	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C472	1-123-356-00	ELECT	10MF	20%	16V	
C474	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C475	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C476	1-130-484-00	MYLAR	0.012MF	5%	50V	
C520	1-123-372-00	ELECT	33MF	20%	63V	
C521	1-101-004-00	CERAMIC	0.01MF		50V	
C522	1-101-361-00	CERAMIC	150PF	5%	50V	
C523	1-130-495-00	MYLAR	0.1MF	5%	50V	
C524	1-130-493-00	MYLAR	0.068MF	5%	50V	
C525	1-130-493-00	MYLAR	0.068MF	5%	50V	
C526	1-102-963-00	CERAMIC	33PF	5%	50V	
C528	1-130-491-00	MYLAR	0.047MF	5%	50V	
C529	1-123-330-00	ELECT	22MF	20%	16V	
C608	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C609	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C610	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C614	1-123-356-00	ELECT	10MF	20%	16V	
C615	1-124-655-11	ELECT	0.47MF	20%	50V	
C638	1-102-965-00	CERAMIC	39PF	5%	50V	
C639	1-102-953-00	CERAMIC	18PF	5%	50V	
C640	1-123-356-00	ELECT	10MF	20%	25V	
C641	1-123-330-00	ELECT	22MF	20%	16V	
C642	1-130-477-00	MYLAR	0.0033MF	5%	50V	
C646	1-102-971-00	CERAMIC	82PF	5%	50V	
C647	1-102-074-00	CERAMIC	0.001MF	10%	50V	

When indicating parts by reference number, please include the board name.

ST-12

Ref.No	Part No.	Description			Remark
C648	1-123-379-00	ELECT	0.47MF	20%	50V
C649	1-123-381-00	ELECT	2.2MF	20%	50V
C650	1-123-333-00	ELECT	100MF	20%	16V
C651	1-101-004-00	CERAMIC	0.01MF		50V
C652	1-123-380-00	ELECT	1MF	20%	50V
C653	1-123-356-00	ELECT	10MF	20%	16V
C655	1-123-333-00	ELECT	100MF	20%	16V
C656	1-123-333-00	ELECT	100MF	20%	16V
C701	1-123-382-00	ELECT	3.3MF	20%	50V
C702	1-123-381-00	ELECT	2.2MF	20%	50V
C703	1-123-306-00	ELECT	47MF	20%	6.3V
C704	1-123-307-00	ELECT	100MF	20%	6.3V

FILTER

Ref.No	Part No.	Description
CF401	1-567-470-11	VIBRATOR, CERAMIC

CONNECTOR

Ref.No	Part No.	Description
CN001	*1-560-891-00	PIN, CONNECTOR 3P
CN002	*1-560-894-00	PIN, CONNECTOR 6P
CN003	*1-560-891-00	PIN, CONNECTOR 3P
CN004	*1-560-892-00	PIN, CONNECTOR 4P
CN005	*1-560-891-00	PIN, CONNECTOR 3P
CN006	*1-560-891-00	PIN, CONNECTOR 3P
CN007	*1-560-891-00	PIN, CONNECTOR 3P
CN008	*1-560-894-00	PIN, CONNECTOR 6P
CN009	*1-560-897-00	PIN, CONNECTOR 9P
CN010	*1-560-891-00	PIN, CONNECTOR 3P
CN011	*1-560-894-00	PIN, CONNECTOR 6P
CN012	*1-560-891-00	PIN, CONNECTOR 3P
CN013	*1-560-892-00	PIN, CONNECTOR 4P
CN014	*1-560-896-00	PIN, CONNECTOR 8P
CN017	*1-560-891-00	PIN, CONNECTOR 3P
CN018	*1-560-466-00	PIN, CONNECTOR 3P
CN019	*1-564-104-00	PIN, CONNECTOR 3P
CN020	*1-560-892-00	PIN, CONNECTOR 4P
CN021	*1-560-892-00	PIN, CONNECTOR 4P
CN022	*1-560-891-00	PIN, CONNECTOR 3P
CN023	*1-560-891-00	PIN, CONNECTOR 3P
CN025	*1-560-893-00	PIN, CONNECTOR 5P
CN026	*1-560-892-00	PIN, CONNECTOR 4P
CN027	*1-560-892-00	PIN, CONNECTOR 4P
CN028	*1-560-894-00	PIN, CONNECTOR 6P
CN030	*1-560-894-00	PIN, CONNECTOR 6P
CN031	*1-560-891-00	PIN, CONNECTOR 3P

JACK

Ref.No	Part No.	Description
CNJ401	1-507-841-00	JACK, MINIATURE (CONTROL S INPUT)
CNJ402	1-507-841-00	JACK, MINIATURE (CONTROL S OUTPUT)

TRIMMER

Ref.No	Part No.	Description
CT301	1-141-227-00	CAP, CERAMIC TRIMMER

DIODE

Ref.No	Part No.	Description	Remark
D001	8-719-911-19	DIODE 1SS119	
D002	8-719-101-50	DIODE RD5.1EL2	
D051	8-719-911-19	DIODE 1SS119	
D055	8-719-000-12	DIODE MC931	
D201	8-719-911-19	DIODE 1SS119	
D220	8-719-911-19	DIODE 1SS119	
D222	8-719-000-06	DIODE MC921	
D301	8-719-200-23	DIODE 11ES2	
D302	8-719-911-19	DIODE 1SS119	
D303	8-719-101-47	DIODE RD4.7EL2	
D304	8-719-101-17	DIODE RD36EB2	
D305	8-719-200-23	DIODE 11ES2	
D306	8-719-200-23	DIODE 11ES2	
D307	8-719-100-38	DIODE RD6.2EB2	
D310	8-719-911-19	DIODE 1SS119	
D311	8-719-911-19	DIODE 1SS119	
D312	8-719-911-19	DIODE 1SS119	
D401	8-719-911-19	DIODE 1SS119	
D405	8-719-911-19	DIODE 1SS119	
D406	8-719-000-06	DIODE MC921	
D407	8-719-000-06	DIODE MC921	
D601	8-719-911-19	DIODE 1SS119	
D604	8-719-911-19	DIODE 1SS119	
D701	8-719-000-06	DIODE MC921	
D702	8-719-000-12	DIODE MC931	

IC

Ref.No	Part No.	Description
IC001	8-752-012-41	IC CX20124A
IC002	8-759-205-76	IC TC504013BP
IC003	8-759-923-97	IC BA4561
IC201	8-759-132-40	IC UPC324C
IC202	8-759-600-24	IC M54543L
IC203	8-759-802-60	IC LB1205
IC301	8-752-800-78	IC CXP5016H-155S
IC302	8-759-603-41	IC M58655P
IC303	8-759-913-41	IC S-8054ALB
IC401	8-759-938-28	IC MB88551-222N
IC402	8-759-800-72	IC LA7205
IC403	8-759-938-27	IC MB88201H-507M
IC404	8-759-802-59	IC LB1211
IC405	8-759-802-59	IC LB1211
IC501	8-759-602-16	IC M54572L
IC502	8-759-157-40	IC UPC574J
IC701	8-759-240-53	IC TC4053BP
IC702	8-759-132-40	IC UPC324C

IF BLOCK

Ref.No	Part No.	Description
IF001	1-464-553-11	IF BLOCK (IFB-389)

COIL

Ref.No	Part No.	Description
L201	1-408-710-00	COIL, CHOKE

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
L401	1-410-116-11	MICRO INDUCTOR 0.56MMH	
L609	1-408-411-00	MICRO INDUCTOR 15UH	
L610	1-407-879-00	COIL, CHOKE 33MMH	
L611	1-408-421-00	MICRO INDUCTOR 100UH	
L620	1-408-428-00	MICRO INDUCTOR 390UH	

INDICATOR TUBE

Ref.No	Part No.	Description	Remark
ND301	1-519-356-11	INDICATOR TUBE, FLUORESCENT	

IC LINK

Ref.No	Part No.	Description	Remark
PS001⚠	1-532-727-11	LINK, IC	
PS002⚠	1-532-727-11	LINK, IC	
PS003⚠	1-532-727-11	LINK, IC	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q001	8-729-177-33	TRANSISTOR 2SD773-4	
Q016	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q017	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q050	8-729-600-27	TRANSISTOR 2SC634SP	
Q051	8-729-600-27	TRANSISTOR 2SC634SP	
Q052	8-729-600-27	TRANSISTOR 2SC634SP	
Q201	8-729-107-25	TRANSISTOR 2SD1585-L	
Q202	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q203	8-729-600-27	TRANSISTOR 2SC634SP	
Q204	8-729-177-23	TRANSISTOR 2SB772	
Q205	8-729-900-89	TRANSISTOR DTC144ES	
Q206	8-729-177-33	TRANSISTOR 2SD773-4	
Q207	8-729-177-33	TRANSISTOR 2SD773-4	
Q209	8-729-600-27	TRANSISTOR 2SC634SP	
Q221	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q249	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q250	8-729-113-33	TRANSISTOR 2SB733-4	
Q251	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q252	8-729-600-27	TRANSISTOR 2SC634SP	
Q301	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q302	8-729-600-27	TRANSISTOR 2SC634SP	
Q401	8-729-900-89	TRANSISTOR DTC144ES	
Q402	8-729-900-61	TRANSISTOR DTA114ES	
Q405	8-729-600-27	TRANSISTOR 2SC634SP	
Q406	8-729-900-65	TRANSISTOR DTA144ES	
Q407	8-729-900-89	TRANSISTOR DTC144ES	
Q408	8-729-900-89	TRANSISTOR DTC144ES	
Q409	8-729-117-54	TRANSISTOR 2SA1175-F	
Q450	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q451	8-729-900-89	TRANSISTOR DTC144ES	
Q452	8-729-900-89	TRANSISTOR DTC144ES	
Q501	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q504	8-729-600-27	TRANSISTOR 2SC634SP	
Q603	8-729-600-27	TRANSISTOR 2SC634SP	
Q604	8-729-600-27	TRANSISTOR 2SC634SP	
Q605	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q606	8-729-900-74	TRANSISTOR DTC143TS	
Q701	8-729-600-27	TRANSISTOR 2SC634SP	
Q702	8-729-900-80	TRANSISTOR DTC114ES	
Q703	8-729-900-80	TRANSISTOR DTC114ES	

Ref.No	Part No.	Description				Remark
Q704	8-729-900-89	TRANSISTOR DTC144ES				
Q705	8-729-900-80	TRANSISTOR DTC114ES				
Q750	8-729-600-27	TRANSISTOR 2SC634SP				

RESISTOR

Ref.No	Part No.	Description				Remark
R001	1-247-895-00	CARBON	470K	5%	1/6W	
R002	1-249-441-11	CARBON	100K	5%	1/6W	
R003	1-247-903-00	CARBON	1M	5%	1/6W	
R004	1-247-889-00	CARBON	270K	5%	1/6W	
R005	1-249-435-11	CARBON	33K	5%	1/6W	
R006	1-228-995-00	RES, ADJ, CARBON 22K				
R006	1-249-429-11	CARBON	10K	5%	1/6W	
R008	1-215-465-00	METAL	68K	1%	1/6W	
R009	1-249-435-11	CARBON	33K	5%	1/6W	
R010	1-249-441-11	CARBON	100K	5%	1/6W	
R011	1-215-467-00	METAL	82K	1%	1/6W	
R012	1-249-441-11	CARBON	100K	5%	1/6W	
R013	1-249-440-11	CARBON	82K	5%	1/6W	
R014	1-249-440-11	CARBON	82K	5%	1/6W	
R015	1-247-859-00	CARBON	15K	5%	1/6W	
R016	1-249-437-11	CARBON	47K	5%	1/6W	
R017	1-247-845-00	CARBON	3.9K	5%	1/6W	
R019	1-247-895-00	CARBON	470K	5%	1/6W	
R020	1-247-889-00	CARBON	270K	5%	1/6W	
R021	1-247-887-00	CARBON	220K	5%	1/6W	
R022	1-249-437-11	CARBON	47K	5%	1/6W	
R024	1-247-857-00	CARBON	12K	5%	1/6W	
R026	1-249-417-11	CARBON	1K	5%	1/6W	
R027	1-249-437-11	CARBON	47K	5%	1/6W	
R028	1-249-429-11	CARBON	10K	5%	1/6W	
R029	1-249-429-11	CARBON	10K	5%	1/6W	
R032	1-249-429-11	CARBON	10K	5%	1/6W	
R033	1-247-875-00	CARBON	68K	5%	1/6W	
R034	1-247-845-00	CARBON	3.9K	5%	1/6W	
R035	1-249-429-11	CARBON	10K	5%	1/6W	
R036	1-249-429-11	CARBON	10K	5%	1/6W	
R037	1-249-437-11	CARBON	47K	5%	1/6W	
R038	1-247-869-00	CARBON	39K	5%	1/6W	
R039	1-249-429-11	CARBON	10K	5%	1/6W	
R040	1-249-429-11	CARBON	10K	5%	1/6W	
R041	1-249-433-11	CARBON	22K	5%	1/6W	
R042	1-249-420-11	CARBON	1.8K	5%	1/6W	
R043	1-249-419-11	CARBON	1.5K	5%	1/6W	
R044	1-249-441-11	CARBON	100K	5%	1/6W	
R045	1-249-434-11	CARBON	27K	5%	1/6W	
R046	1-247-859-00	CARBON	15K	5%	1/6W	
R047	1-249-429-11	CARBON	10K	5%	1/6W	
R048	1-215-443-00	METAL	8.2K	1%	1/6W	
R049	1-215-455-00	METAL	27K	1%	1/6W	
R051	1-215-449-00	METAL	15K	1%	1/6W	
R052	1-249-429-11	CARBON	10K	5%	1/6W	
R053	1-247-859-00	CARBON	39K	5%	1/6W	
R054	1-247-869-00	CARBON	39K	5%	1/6W	

When indicating parts by reference number, please include the board name.

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ST-12

Ref.No	Part No.	Description				Remark
R055	1-249-433-11	CARBON	22K	5%	1/6W	
R056	1-249-433-11	CARBON	22K	5%	1/6W	
R057	1-249-435-11	CARBON	33K	5%	1/6W	
R058	1-247-857-00	CARBON	12K	5%	1/6W	
R059	1-249-440-11	CARBON	82K	5%	1/6W	
R060	1-249-429-11	CARBON	10K	5%	1/6W	
R061	1-249-425-11	CARBON	4.7K	5%	1/6W	
R062 ⚠	1-206-451-01	METAL OXIDE	3.3	5%	2W	F
R064	1-249-429-11	CARBON	10K	5%	1/6W	
R066	1-249-441-11	CARBON	100K	5%	1/6W	
R067	1-249-441-11	CARBON	100K	5%	1/6W	
R068	1-247-869-00	CARBON	39K	5%	1/6W	
R069	1-249-441-11	CARBON	100K	5%	1/6W	
R070	1-249-441-11	CARBON	100K	5%	1/6W	
R071	1-247-873-00	CARBON	56K	5%	1/6W	
R072	1-247-903-00	CARBON	1M	5%	1/6W	
R073	1-249-441-11	CARBON	100K	5%	1/6W	
R074	1-249-429-11	CARBON	10K	5%	1/6W	
R075 ⚠	1-212-356-00	METAL OXIDE	0.47	5%	1W	F
R076	1-249-405-11	CARBON	100	5%	1/6W	
R077 ⚠	1-212-360-00	METAL OXIDE	1	5%	1W	F
R078	1-249-423-11	CARBON	3.3K	5%	1/6W	
R079	1-249-423-11	CARBON	3.3K	5%	1/6W	
R080	1-249-435-11	CARBON	33K	5%	1/6W	
R081	1-249-417-11	CARBON	1K	5%	1/6W	
R082	1-249-435-11	CARBON	33K	5%	1/6W	
R083	1-247-875-00	CARBON	68K	5%	1/6W	
R084	1-249-435-11	CARBON	33K	5%	1/6W	
R085	1-247-819-00	CARBON	330	5%	1/6W	
R086	1-249-423-11	CARBON	3.3K	5%	1/6W	
R087	1-249-423-11	CARBON	3.3K	5%	1/6W	
R088	1-249-434-11	CARBON	27K	5%	1/6W	
R097	1-249-437-11	CARBON	47K	5%	1/6W	
R098	1-249-419-11	CARBON	1.5K	5%	1/6W	
R301	1-249-441-11	CARBON	100K	5%	1/6W	
R302	1-249-429-11	CARBON	10K	5%	1/6W	
R303	1-249-434-11	CARBON	27K	5%	1/6W	
R304	1-249-437-11	CARBON	47K	5%	1/6W	
R305	1-249-405-11	CARBON	100	5%	1/6W	
R306	1-249-425-11	CARBON	4.7K	5%	1/6W	
R307	1-249-437-11	CARBON	47K	5%	1/6W	
R308	1-249-441-11	CARBON	100K	5%	1/6W	
R309	1-249-417-11	CARBON	1K	5%	1/6W	
R310	1-249-417-11	CARBON	1K	5%	1/6W	
R311	1-249-417-11	CARBON	1K	5%	1/6W	
R312	1-249-417-11	CARBON	1K	5%	1/6W	
R313	1-249-429-11	CARBON	10K	5%	1/6W	
R314	1-249-429-11	CARBON	10K	5%	1/6W	
R317	1-249-429-11	CARBON	10K	5%	1/6W	
R318	1-249-429-11	CARBON	10K	5%	1/6W	
R319	1-247-833-00	CARBON	1.2K	5%	1/6W	
R320	1-247-713-11	CARBON	1K	5%	1/4W	
R404	1-249-425-11	CARBON	4.7K	5%	1/6W	
R405	1-249-441-11	CARBON	100K	5%	1/6W	

Ref.No	Part No.	Description				Remark
R406	1-249-417-11	CARBON	1K	5%	1/6W	
R407	1-249-417-11	CARBON	1K	5%	1/6W	
R408	1-249-417-11	CARBON	1K	5%	1/6W	
R409	1-249-417-11	CARBON	1K	5%	1/6W	
R411	1-249-417-11	CARBON	1K	5%	1/6W	
R412	1-247-862-00	CARBON	20K	5%	1/6W	
R413	1-249-432-11	CARBON	18K	5%	1/6W	
R414	1-247-873-00	CARBON	56K	5%	1/6W	
R415	1-249-420-11	CARBON	1.8K	5%	1/6W	
R416	1-247-833-00	CARBON	1.2K	5%	1/6W	
R417	1-249-429-11	CARBON	10K	5%	1/6W	
R418	1-249-434-11	CARBON	27K	5%	1/6W	
R419	1-249-432-11	CARBON	18K	5%	1/6W	
R420	1-247-839-00	CARBON	2.2K	5%	1/6W	
R421	1-247-849-00	CARBON	5.6K	5%	1/6W	
R422	1-249-429-11	CARBON	10K	5%	1/6W	
R423	1-247-839-00	CARBON	2.2K	5%	1/6W	
R424	1-249-441-11	CARBON	100K	5%	1/6W	
R425	1-249-435-11	CARBON	33K	5%	1/6W	
R426	1-247-839-00	CARBON	2.2K	5%	1/6W	
R427	1-249-417-11	CARBON	1K	5%	1/6W	
R428	1-249-437-11	CARBON	47K	5%	1/6W	
R429	1-249-437-11	CARBON	47K	5%	1/6W	
R430	1-249-405-11	CARBON	100	5%	1/6W	
R431	1-249-417-11	CARBON	1K	5%	1/6W	
R432	1-249-441-11	CARBON	100K	5%	1/6W	
R433	1-247-849-00	CARBON	5.6K	5%	1/6W	
R434	1-247-839-00	CARBON	2.2K	5%	1/6W	
R435	1-249-433-11	CARBON	22K	5%	1/6W	
R436	1-249-419-11	CARBON	1.5K	5%	1/6W	
R450	1-247-849-00	CARBON	5.6K	5%	1/6W	
R451	1-249-429-11	CARBON	10K	5%	1/6W	
R452	1-247-845-00	CARBON	3.9K	5%	1/6W	
R453	1-249-429-11	CARBON	10K	5%	1/6W	
R456	1-249-429-11	CARBON	10K	5%	1/6W	
R457	1-249-429-11	CARBON	10K	5%	1/6W	
R470	1-249-405-11	CARBON	100	5%	1/6W	
R471	1-249-441-11	CARBON	100K	5%	1/6W	
R472	1-247-839-00	CARBON	2.2K	5%	1/6W	
R473	1-249-429-11	CARBON	10K	5%	1/6W	
R474	1-249-429-11	CARBON	10K	5%	1/6W	
R480	1-247-853-31	CARBON	10K	5%	1/6W	
R481	1-247-853-31	CARBON	10K	5%	1/6W	
R482	1-247-823-00	CARBON	470	5%	1/6W	
R510	1-249-417-11	CARBON	1K	5%	1/6W	
R511	1-247-839-00	CARBON	2.2K	5%	1/6W	
R512	1-249-429-11	CARBON	10K	5%	1/6W	
R513	1-249-429-11	CARBON	10K	5%	1/6W	
R514	1-249-429-11	CARBON	10K	5%	1/6W	
R515	1-249-433-11	CARBON	22K	5%	1/6W	
R516	1-249-433-11	CARBON	22K	5%	1/6W	
R517	1-249-433-11	CARBON	22K	5%	1/6W	
R518	1-247-891-00	CARBON	330K	5%	1/6W	
R520	1-249-419-11	CARBON	1.5K	5%	1/6W	
R608	1-247-883-00	CARBON	150K	5%	1/6W	
R609	1-249-423-11	CARBON	3.3K	5%	1/6W	

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description				Remark
R610	1-247-883-00	CARBON	150K	5%	1/6W	
R611	1-249-423-11	CARBON	3.3K	5%	1/6W	
R612	1-247-873-00	CARBON	56K	5%	1/6W	
R613	1-247-873-00	CARBON	56K	5%	1/6W	
R622	1-247-815-00	CARBON	220	5%	1/6W	
R625	1-249-405-11	CARBON	100	5%	1/6W	
R628	1-247-817-00	CARBON	270	5%	1/6W	
R629	1-249-425-11	CARBON	4.7K	5%	1/6W	
R630	1-247-819-00	CARBON	330	5%	1/6W	
R631	1-247-821-00	CARBON	390	5%	1/6W	
R632	1-249-433-11	CARBON	22K	5%	1/6W	
R633	1-249-441-11	CARBON	100K	5%	1/6W	
R634	1-249-433-11	CARBON	22K	5%	1/6W	
R635 ⚠	1-249-405-11	CARBON	100	5%	1/6W	F
R636	1-249-429-11	CARBON	10K	5%	1/6W	
R637	1-249-429-11	CARBON	10K	5%	1/6W	
R640	1-249-429-11	CARBON	10K	5%	1/6W	
R641	1-249-432-11	CARBON	18K	5%	1/6W	
R642	1-247-869-00	CARBON	39K	5%	1/6W	
R643	1-249-417-11	CARBON	1K	5%	1/6W	
R644	1-249-417-11	CARBON	1K	5%	1/6W	
R645	1-249-435-11	CARBON	33K	5%	1/6W	
R701	1-249-414-11	CARBON	560	5%	1/6W	
R702	1-247-823-00	CARBON	470	5%	1/6W	
R703	1-249-437-11	CARBON	47K	5%	1/6W	
R704	1-249-429-11	CARBON	10K	5%	1/6W	
R705	1-249-417-11	CARBON	1K	5%	1/6W	
R706	1-249-423-11	CARBON	3.3K	5%	1/6W	
R707	1-247-851-00	CARBON	6.8K	5%	1/6W	
R708	1-249-420-11	CARBON	1.8K	5%	1/6W	
R709	1-247-903-00	CARBON	1M	5%	1/6W	
R710	1-247-859-00	CARBON	15K	5%	1/6W	
R711	1-247-859-00	CARBON	15K	5%	1/6W	
R712	1-247-851-00	CARBON	6.8K	5%	1/6W	
R713	1-249-433-11	CARBON	22K	5%	1/6W	
R714	1-247-899-00	CARBON	680K	5%	1/6W	
R716	1-249-417-11	CARBON	1K	5%	1/6W	
R717	1-249-437-11	CARBON	47K	5%	1/6W	
R718	1-249-437-11	CARBON	47K	5%	1/6W	
R750	1-249-437-11	CARBON	47K	5%	1/6W	
R751	1-249-417-11	CARBON	1K	5%	1/6W	

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV001	1-228-996-00	RES, ADJ, METAL GLAZE 47K
RV002	1-228-997-00	RES, ADJ, METAL GLAZE 100K
RV003	1-228-997-00	RES, ADJ, CARBON 100K
RV004	1-228-997-00	RES, ADJ, CARBON 100K
RV007	1-228-996-00	RES, ADJ, METAL GLAZE 47K
RV009	1-228-998-00	RES, ADJ, CARBON 220K
RV401	1-228-991-00	RES, ADJ, CARBON 2.2K

SWITCH

Ref.No	Part No.	Description	Remark
S301	1-553-725-21	SWITCH, SLIDE (AFT)	
S304	1-553-856-00	SWITCH, KEY BOARD (CLEAR)	
S305	1-553-856-00	SWITCH, KEY BOARD (TUNING+)	
S306	1-553-856-00	SWITCH, KEY BOARD (TUNING-)	
S307	1-553-856-00	SWITCH, KEY BOARD (SET)	
S401	1-553-856-00	SWITCH, KEY BOARD (STILL ADJ)	

TUNER

Ref.No	Part No.	Description
TU001 ⚠	1-463-584-11	TUNER, ET (BT-881A)

CRYSTAL

Ref.No	Part No.	Description
X301	1-567-519-11	VIBRATOR, CRYSTAL (4.19MHZ)

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*1-620-054-11 PS-115 BOARD

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Part No.	Description
1-533-189-11	HOLDER, FUSE
*1-535-444-00	TERMINAL

CAPACITOR

Ref.No	Part No.	Description				Remark
C001 ⚠	1-136-472-11	FILM	0.1MF	20%	250V	
C002	1-125-349-00	ELECT(BLOCK)	6800MF	20%	25V	
C003	1-123-381-00	ELECT	2.2MF	20%	50V	
C004	1-123-332-00	ELECT	47MF	20%	25V	
C005	1-123-333-00	ELECT	100MF	20%	16V	
C006	1-123-333-00	ELECT	100MF	20%	16V	
C007	1-125-349-00	ELECT(BLOCK)	6800MF	20%	25V	

CONNECTOR

Ref.No	Part No.	Description
CN001	*1-560-895-00	PIN, CONNECTOR 7P
CN002	*1-564-104-00	PIN, CONNECTOR 3P
CN003	*1-560-894-00	PIN, CONNECTOR 6P
CN004	*1-560-891-00	PIN, CONNECTOR 3P

DIODE

Ref.No	Part No.	Description
D001 ⚠	8-719-500-32	DIODE D3SB10
D002 ⚠	8-719-500-32	DIODE D3SB10

FUSE

Ref.No	Part No.	Description
F001 ⚠	1-532-203-00	FUSE, TIME-LAG 2.0A
F002 ⚠	1-532-203-00	FUSE, TIME-LAG 2.0A
F003 ⚠	1-532-203-00	FUSE, TIME-LAG 2.0A

IC

Ref.No	Part No.	Description
IC001 ⚠	8-749-954-41	IC STK5441

RESISTOR

Ref.No	Part No.	Description				Remark
R002 ⚠	1-212-958-00	FUSIBLE	10	5%	1/2W	F
R003	1-247-707-11	CARBON	390	5%	1/4W	
R004	1-247-707-11	CARBON	390	5%	1/4W	

****

When indicating parts by reference number, please include the board name.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description	Remark
	*1-614-828-11	MI-5 BOARD ***********	
		CONNECTOR	
CN001	*1-564-013-00	PIN, CONNECTOR 3P	
		DIODE	
PH001	8-719-913-41	DIODE SPI201-22	
		RESISTOR	
R001	1-247-826-00	CARBON 620 5% 1/6W	
R002	1-249-429-11	CARBON 10K 5% 1/6W	

****

Ref.No	Part No.	Description	Remark
	*1-614-829-11	MI-6 BOARD ***********	
		CONNECTOR	
CN002	*1-564-002-00	PIN, CONNECTOR 3P	
		DIODE	
PH002	8-719-913-41	DIODE SPI201-22	
		RESISTOR	
R004	1-247-826-00	CARBON 620 5% 1/6W	
R005	1-249-429-11	CARBON 10K 5% 1/6W	

****

Ref.No	Part No.	Description	Remark
	*1-614-597-11	LM-16 BOARD ************	

****

Ref.No	Part No.	Description	Remark
	1-620-051-11	MF-15 BOARD ************	
		DIODE	
D203	8-719-812-33	DIODE TLG123A (ON/STANDBY)	
		RESISTOR	
R005	1-247-707-11	CARBON 390 5% 1/4W	
		SWITCH	
S212	1-553-856-00	SWITCH, KEY BOARD (ON/STANDBY)	

****

Ref.No	Part No.	Description	Remark
	*1-620-052-11	MF-16 BOARD ************	
		CONNECTOR	
CN001	*1-564-019-11	PIN, CONNECTOR 9P	
CN002	*1-564-014-00	PIN, CONNECTOR 4P	
CN003	*1-564-013-00	PIN, CONNECTOR 3P	
CN007	*1-564-017-00	PIN, CONNECTOR 7P	
CN008	*1-564-013-00	PIN, CONNECTOR 3P	
CN009	*1-564-013-00	PIN, CONNECTOR 3P	
		DIODE	
D202	8-719-911-19	DIODE 1SS119	
		IC	
IC101	8-741-138-70	IC BX-1387	
		RESISTOR	
R001	1-247-839-00	CARBON 2.2K 5% 1/6W	
R002	1-247-859-00	CARBON 15K 5% 1/6W	
R101	1-247-833-00	CARBON 1.2K 5% 1/6W	
R102	1-249-420-11	CARBON 1.8K 5% 1/6W	
R103	1-249-423-11	CARBON 3.3K 5% 1/6W	
R104	1-247-833-00	CARBON 1.2K 5% 1/6W	
R105	1-247-848-00	CARBON 5.1K 5% 1/6W	
R107	1-247-853-00	CARBON 8.2K 5% 1/6W	
R108	1-247-833-00	CARBON 1.2K 5% 1/6W	
R109	1-249-420-11	CARBON 1.8K 5% 1/6W	
R110	1-249-423-11	CARBON 3.3K 5% 1/6W	
R111	1-247-853-00	CARBON 8.2K 5% 1/6W	
R201	1-249-429-11	CARBON 10K 5% 1/6W	
R202	1-249-429-11	CARBON 10K 5% 1/6W	
R203	1-249-429-11	CARBON 10K 5% 1/6W	
R204	1-249-429-11	CARBON 10K 5% 1/6W	
		VARIABLE RESISTOR	
RV001	1-230-430-11	RES, VAR, CARBON 10K	
		SWITCH	
S005	1-553-716-00	SWITCH, SLIDE (INPUT SELECT)	
S009	1-553-751-00	SWITCH, SLIDE (SUPER BETA)	
S101	1-553-856-00	SWITCH, KEY BOARD (◀◀)	
S102	1-553-856-00	SWITCH, KEY BOARD (EJECT)	
S103	1-553-856-00	SWITCH, KEY BOARD (GO TO ZERO)	
S104	1-553-856-00	SWITCH, KEY BOARD (▶▶)	
S105	1-553-856-00	SWITCH, KEY BOARD (▶)	
S108	1-553-856-00	SWITCH, KEY BOARD (TRACKING+)	
S109	1-553-856-00	SWITCH, KEY BOARD (■ STOP)	
S110	1-553-856-00	SWITCH, KEY BOARD (❚❚ / ▶◀)	
S111	1-553-856-00	SWITCH, KEY BOARD (❚❚▶)	
S113	1-553-856-00	SWITCH, KEY BOARD (TRACKING-)	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
S202	1-553-856-00	SWITCH, KEY BOARD (CLEAR/RESET)	
S204	1-553-856-00	SWITCH, KEY BOARD (CLOCK SET)	
S205	1-553-856-00	SWITCH, KEY BOARD (CHECK)	
S206	1-553-856-00	SWITCH, KEY BOARD (TIMER SET)	
S207	1-553-856-00	SWITCH, KEY BOARD (PROGRAM/TIMER-)	
S208	1-553-856-00	SWITCH, KEY BOARD (PROGRAM/TIMER+)	
S209	1-553-856-00	SWITCH, KEY BOARD (NEXT)	
S210	1-553-856-00	SWITCH, KEY BOARD (TIMER REC)	
S211	1-553-856-00	SWITCH, KEY BOARD (QUICK TIMER)	

* * *

*1-620-053-11 MF-17 BOARD

CONNECTOR

Ref.No	Part No.	Description	Remark
CN701	*1-564-013-00	PIN, CONNECTOR 3P	
CN702	*1-564-013-00	PIN, CONNECTOR 3P	

DIOD

Ref.No	Part No.	Description	Remark
D007	8-719-812-32	DIODE TLY123 (SYNCHRO EDIT)	

RESISTOR

Ref.No	Part No.	Description				Remark
R011	1-247-711-11	CARBON	680	5%	1/4W	
R104	1-247-853-00	CARBON	8.2K	5%	1/6W	

SWITCH

Ref.No	Part No.	Description	Remark
S107	1-553-856-00	SWITCH, KEY BOARD (SLOW+)	
S112	1-553-856-00	SWITCH, KEY BOARD (SLOW-)	
S115	1-553-856-00	SWITCH, KEY BOARD (SYNCHRO EDIT)	
S702	1-554-088-00	SWITCH, KEY BOARD (REC)	

* * *

*1-620-055-11 VS-11 BOARD (INDONESIA MODEL)

SWITCH

Ref.No	Part No.	Description	Remark
S001	⚠1-552-304-00	SWITCH(VOLTAGE SELECTOR)(INDONESIA MODEL)	

* * *

DR-38 BOARD

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q223	⚠8-729-107-25	TRANSISTOR 2SD1585-L	

* * *

MISCELLANFOUS

Ref.No	Part No.	Description	Remark
	⚠1-464-690-11	MODULATOR, RF (RFU-857)	
	⚠1-551-908-61	CORD, POWER, EULO PLUG	
L901	X-3693-829-1	SENSOR BLOCK ASSY, S	
L902	X-3693-830-1	SENSOR BLOCK ASSY, T	
M902	8-838-096-01	MOTOR, DC (BHF-1914A) (CAPSTAN)	
M903	A-4910-063-B	R STATOR(REEL MOTOR)BOARD,COMPLETE(REEL)	
M904	X-3679-268-1	MOTOR ASSY, L (LOADING)	
PM901	⚠1-454-349-51	SOLENOID, PLUNGER (PINCH)	
PM902	⚠1-454-371-51	SOLENOID, PLUNGER (BRAKE)	
S901	1-554-839-11	SWITCH, LEAF (2 GANG) (REC PROOF, CASSETTE DOWN)	
S903	⚠1-554-840-11	SWITCH, LEAF (THREADING END)	
S904	⚠1-554-840-11	SWITCH, LEAF (CASSETTE ON)	
T001	⚠1-448-656-11	TRANSFORMER, POWER	

* * *

ACCESSORIES AND PACKING MATERIALS

Part No.	Description	Remark
A-6767-240-A	COMMANDER ASSY (RMT-149)	
1-551-513-00	CORD ASSY, COAXIAL	
*3-677-503-00	SHEET, PROTECTION	
*3-695-072-01	CUSHION (LOWER)	
3-701-625-00	BAG, POLYETHYLENE	
*3-710-562-01	CUSHION (UPPER)	
*3-710-589-01	INDIVIDUAL CARTON (INDONESIA MODEL)	
3-712-801-01	INDIVIDUAL CARTON (Spanish Model)	
3-765-539-41	MANUAL, INSTRUCTION (ENGLISH, Spanish)	

* * *

When indicating parts by reference number, please include the board name.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 7
ADJUSTMENTS

TABLE OF CONTENS

Section *Title* *Page*

1. MECHANICAL CHECK ADJUSTMENT AND PREPARATIONS FOR REPLACEMENT

1-1. Disassembly of Cabinet 128
1-2. Removal of the ST-12 Board 128
1-3. Removal of the VA-26 Board and the VI-23 Board 128
1-4. Removal of the Reel Block Assembly 128
1-5. Removal of the MF-17 Board and the MF-16 Board 128
1-6. Removal of the RP-41 Board 128
1-7. Removal of the PS-115 Board 128
1-8. Removal of the FL Cassette Compartment Assembly 128
1-9. Removal of the MD Block Assembly 128
1-10. Operation of the Unit With the FL Cassette Compartment Removed 128
1-10-1. How to Put the Unit into Threading Completed Mode when the FL Cassette Compartment is Removed 128
1-10-2. Playback Without Cassette Installed 128
1-10-3. How to Put in Recording Mode Without Cassette Installed 128
1-11. How to Load, Thread, Unload and Unthread With the Power OFF 129
1-11-1. Manual Loading and Unloading 129
1-11-2. Manual Threading and Unthreading 129
1-12. Tools and Fixtures Required For Servicing 130

2. PERIODIC CHECK AND MAINTENANCE

2-1. Post-Repair Maintenance 131
2-1-1. Cleaning of Rotating Head Disk Assembly 131
2-1-2. Cleaning of the Tape Movement System 131
2-1-3. Cleaning the Drive System 131
2-2. Periodic Check Items 132
2-3. State of Wear of Video Heads Check 133

3. CHECK ADJUSTMENT AND REPLACEMENT PROCEDURES

3-1. Replacement of Rotating Head Disk Assembly 134
3-1-1. Removal of the Rotating Head Disk Assembly 134
3-1-2. Mounting of the Rotating Head Disk Assembly 134
3-2. Video Head Dihedral Check and Adjustment 135
3-3. Replacement and Adjustment of the Drum Assembly 136
3-3-1. Replacement of the Drum Assembly 136
3-3-2. Adjustment of the Motor Gap when Replacing the Drum Assembly 137
3-4. Replacement of the Capstan Motor 137
3-4-1. Removal of the Capstan Motor 137
3-4-2. Capstan Shaft Verticality Adjustment 138
3-5. Removal of the S Coil Sensor 139
3-6. Removal of Gear Holder 139
3-7. Adjustment of the FL Cassette Compartment 140
3-7-1. Adjustment of the Position of the Right Gear of the FL Cassette Compartment Assembly 140
3-7-2. Cassette ON Switch Operation Check .. 141
3-7-3. Checking and Adjustment of the Cassette Door Assembly 142
3-7-4. Mounting the FL Cassette Compartment Assembly 142
3-8. Removal of the No. 2 and No. 3 Guides .. 143
3-8-1. Removal of the No. 2 Guide 143
3-8-2. Removal of the No. 3 Guide 143
3-9. Replacement and Adjustment of the S Threading Ring 144
3-9-1. Perparation to Remove the S Therading Ring Removal of tge ACE Assembly, FE Head and Threading Motor 144
3-9-2. Removal of the S Threading Ring 146
3-9-3. S Threading Ring Mounting and Position Adjustment 147
3-10. Pinch Snap-Fit Limiter Gap Check and Adjustment 148
3-11. Threading End Switch and T Coil Sensor 149
3-11-1. Threading End Switch (TE Switch) Position Check and Adjustment 149
3-11-2. T Coil Sensor Mounting and Operation Check 150
3-12. Removal and Adjustment of the Reel Block Assembly 151
3-12-1. Removal of the Reel Block Assembly .. 151
3-12-2. Adjustment of the Position of the Tension Regulating Lever 151
3-13. Adjustment of the Forward Back Tension 152
3-14. Adjustment of the Forward Torque 152

4. TAPE PATH ADJUSTMENT

4-1. Tracking Adjustment 153
4-1-1. Preparation for Adjustment 154
4-1-2. Entrance Side Adjustment 154
4-1-3. Exit Side Adjustment 156
4-2. Adjustments After Replacement of the ACE Assembly 157
4-2-1. Exit Side Tracking Adjustment 157
4-2-2. CTL Head (ACE Assembly) Position Adjustment 158
4-2-3. Audio Head (ACE Assembly) Azimuth Adjustment 159
4-2-4. Audio Head (ACE Assembly) Height Adjustment 159
4-3. How to Inspect the Tape Traveling When Adjusting the Tape Path 160

5. ELECTRICAL ADJUSTMENT

5-1. Power Supply Check (PS-115 Board) 163
5-2. System Control Check (ST-12 Board) 163
5-2-1. Clock Frequency Check 163
5-3. Servo System Adjustment 163
5-3-1. Reel Motor Control System Adjustment 163
5-3-2. Drum/Capstan Servo System Adjustment 163
5-4. PAL Video System Adjustment 165
5-4-1. Record System Adjustment 166
5-4-2. Playback System Adjustment 170
5-5. Audio System Adjustment 173
5-6. Tuner System Adjustment 175

1. MECHANICAL CHECK ADJUSTMENT AND PREPARATIONS FOR REPLACEMENT

The 9 items of the disassembly procedure mentioned be low are detailed page23~28.

1-1. DISASSEMBLY OF CABINET
1-2. REMOVAL OF THE ST-12 BOARD
1-3. REMOVAL OF THE AU-26 BOARD AND THE VI-23 BOARD
1-4. REMOVAL OF THE REEL BLOCK ASSEMBLY
1-5. REMOVAL OF THE MF-17 BOARD AND THE MF-16 BOARD
1-6. REMOVAL OF THE RP-41 BOARD
1-7. REMOVAL OF THE PS-115 BOARD
1-8. REMOVAL OF THE FL CASSETTE COMPARTMENT ASSEMBLY
1-9. REMOVAL OF THE MD BLOCK ASSEMBLY

1-10. OPERATION OF THE UNIT WITH THE FL CASSET COMPARTMENT REMOVED

1-10-1. How to Put the Unit into Threading Completed Mode when the FL Cassette Compartment is Removed.

1) Connect ordinary screwdriver to short the leaf switch ❶ (cassette-on switch shown in Fig. 1-1.).
   Note :
   Be careful that the ordinary screwdriver do not touch any other parts (use tape or other insulation).
2) Press the cassette-down switch ❷ and leave it pressed in, when the power button is turned ON, threading starts.
   * Refer to section 2-8 for instructions on how to remove the FL cassette compartment.

[How to EJECT in this condition]

- Press the EJECT button. When unthreading is completed and the internal gear starts to turn, turn the power OFF.

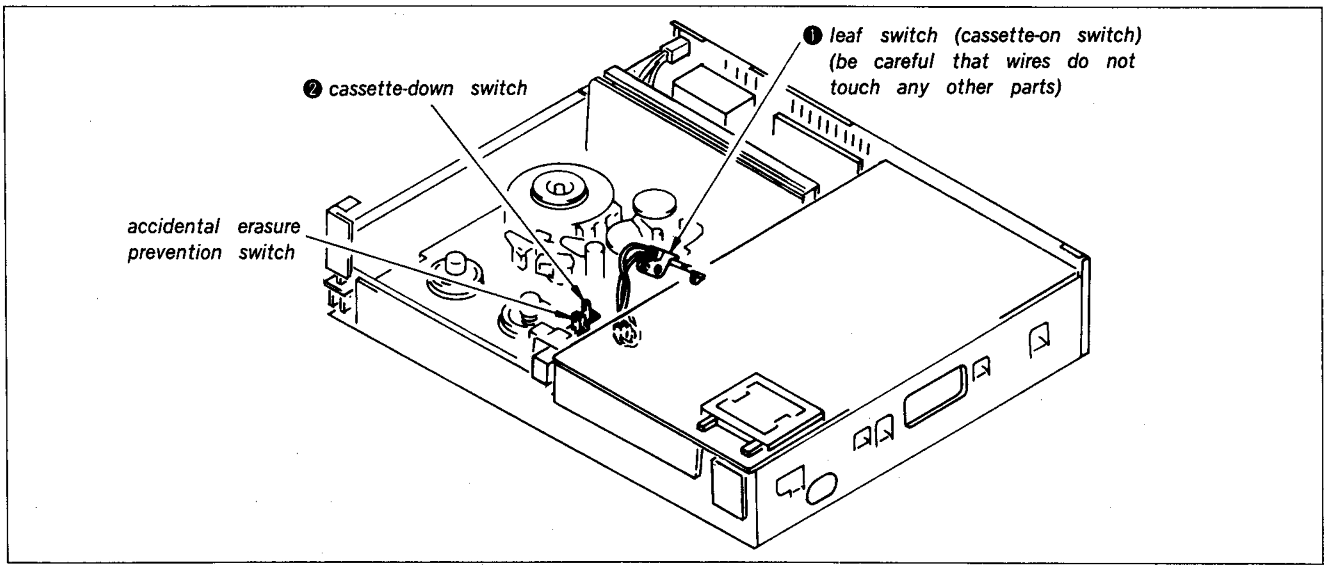

❶ leaf switch (cassette-on switch)
(be careful that wires do not touch any other parts)
❷ cassette-down switch
accidental erasure prevention switch

Fig. 1-1. How to put the unit into Threading completed mode when the FL cassette compartment in removed.

1-10-2. Playback Without Cassette Installed

Complete threading by the procedure described in 1-10-1, then press the palyback button.

1-10-3. How to Put in Recording Mode Without Cassette Installed

1. Thread by the procedure in 1-10-1 than press the accidental erasure prevention switch 1 shown in Fig. 1-2.
2. With the accidental erasure prevention 1 switch pressed down, press the recording button.

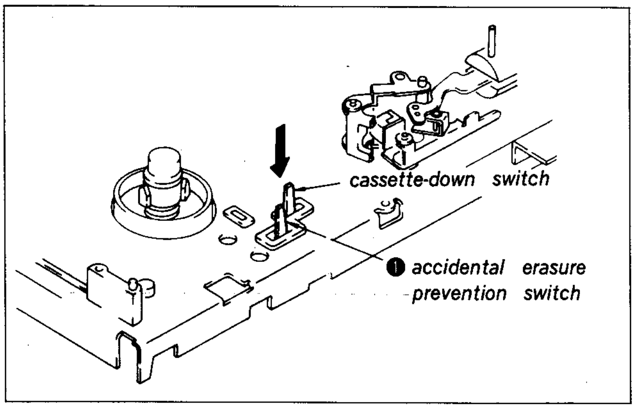

cassette-down switch
❶ accidental erasure prevention switch

Fig. 1-2. How to put the recorder in recording mode with the FL cassette compartment removed

1-11. HOW TO LOAD, THREAD, UNLOAD AND UNTHREAD WITH THE POWER OFF

1-11-1. Manual Loading and Unloading

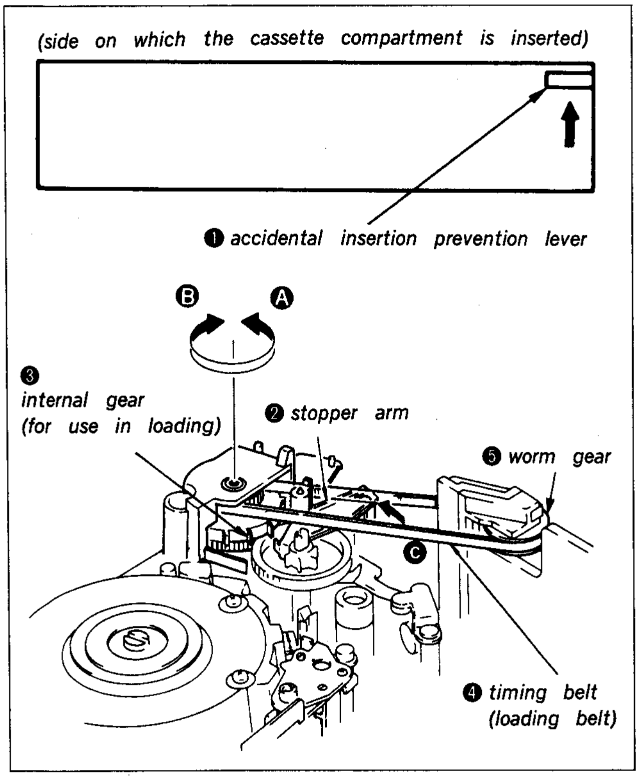

(side on which the cassette compartment is inserted)
❶ accidental insertion prevention lever
Ⓑ
Ⓐ
❸
internal gear
(for use in loading)
❷ stopper arm
❺ worm gear
Ⓒ
❹ timing belt
(loading belt)

Fig. 1-3. Manual loading and unloading

1) Release the right accidental insertion prevention lever ❶ inside the cassette compartment, then press the stopper arm ❷ in the direction of arrow Ⓒ and release the internal gear ❸ stop.
2) Turn the internal gear ❸ manually in the direction of arrow Ⓐ until loading is completed.
3) To unload, turn the internal gear ❸ in the direction of arrow Ⓑ.

Note:

When the loading belt ❹ has been removed, load and unload by turning the worm gear ❺ manually.

1-11-2. Manual Threading and Unthreading

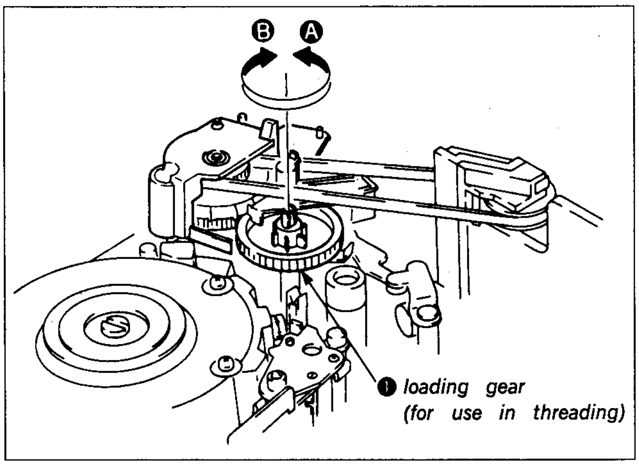

Ⓑ
Ⓐ
❶ loading gear
(for use in threading)

Fig. 1-4. Manual threading and unthreading

1) Turn the loading gear ❶ in the direction of arrow Ⓐ until threading is completed.
2) To unthread, turn the loading gear ❶ in the direction of arrow Ⓑ.

Note:

Always turn the loading gear sideways by hand. Never use a screwdriver or other tool.

1-12. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref. No.	Name	Part Code	Carved Jig No.	Use and Remarks
J-1	Torque Measurement Tape	J-6080-003-C	SL-0003C	forward torque and back tension measurement
J-2	Parallel Plate	J-6086-570-A	SL-0657	audio/CTL head lateral adjustment capstan shaft vertical adjustment
J-3	Dental Mirror (handle) Dental Mirror (mirror)	J-6080-029-A J-6080-030-1	SL-5052	tape path and tape traveling adjustment check
J-4	Alignment Tape (KR5-2H)	8-969-995-52	—	tracking, overall adjustment of picture quality, etc.
J-5	Cleaning Fluid	Y-2031-001-0	—	for cleaning
J-6	Thickness Gauge	9-911-053-00		for clearance check
J-7	Chamois Cloth	2-034-697-00	—	cleaning
J-8	Head Demagnetizer	widely available	—	demagnetization of video head and audio head
J-9	Cleaning Cassette Tape	8-888-004-00	—	video head cleaning
J-10	Dihedral Adjustment Screw	J-6080-013-A	SL-0013	video dihedral adjustment
J-11	Video Head Checker	7-732-080-01	SL-5151	video head check

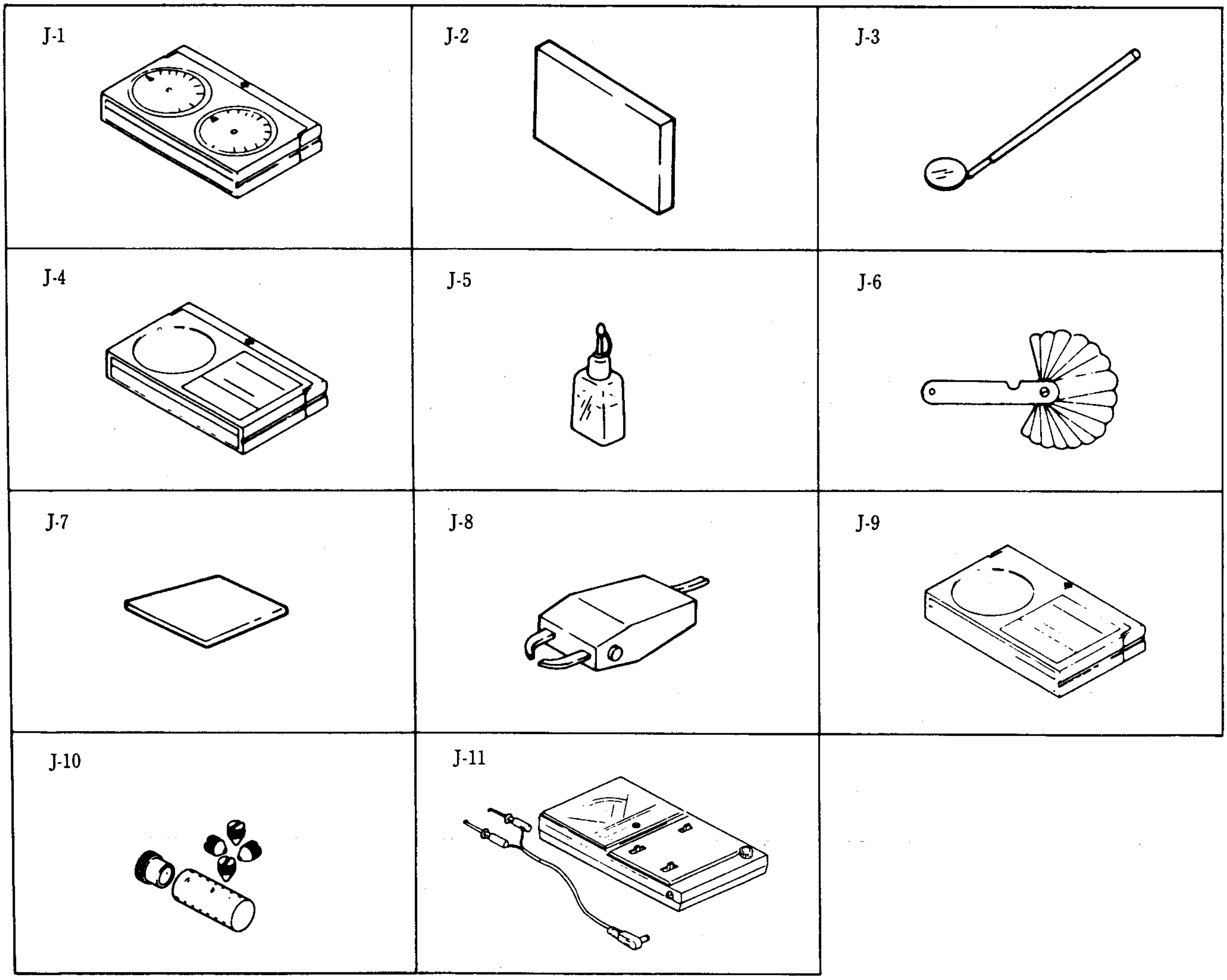


Fig. 1-5. Tools and fixtures required for servicing

2. PERIODIC CHECK AND MAINTENANCE

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes. it is recommended that the following periodic checks and maintenance be performed.

2-1. POST-REPAIR MAINTENANCE

The following must be done after every repair regardless of how many hours the user has operated the machine.

2-1-1. Cleaning of Rotating Head Disk Assembly

1) Press a chamois cloth (Jig Ref. No. J-7) which has been dipped in cleaning fluid (Jig Ref. No. J-5) lightly against the rotating drum assembly, then do the cleanig by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a right angle to the head tip. There is a very great danger of damaging the head tip if this is done.

2-1-2. Cleaning of the Tape Movement System

1) Clean the surfaces which the tape contacts during its movement (tape guide. drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

2-1-3. Cleaning the Drive System

1) Clean the driving parts with a cloth that has been dipped in cleaning fluid.

parts requiring cleaning

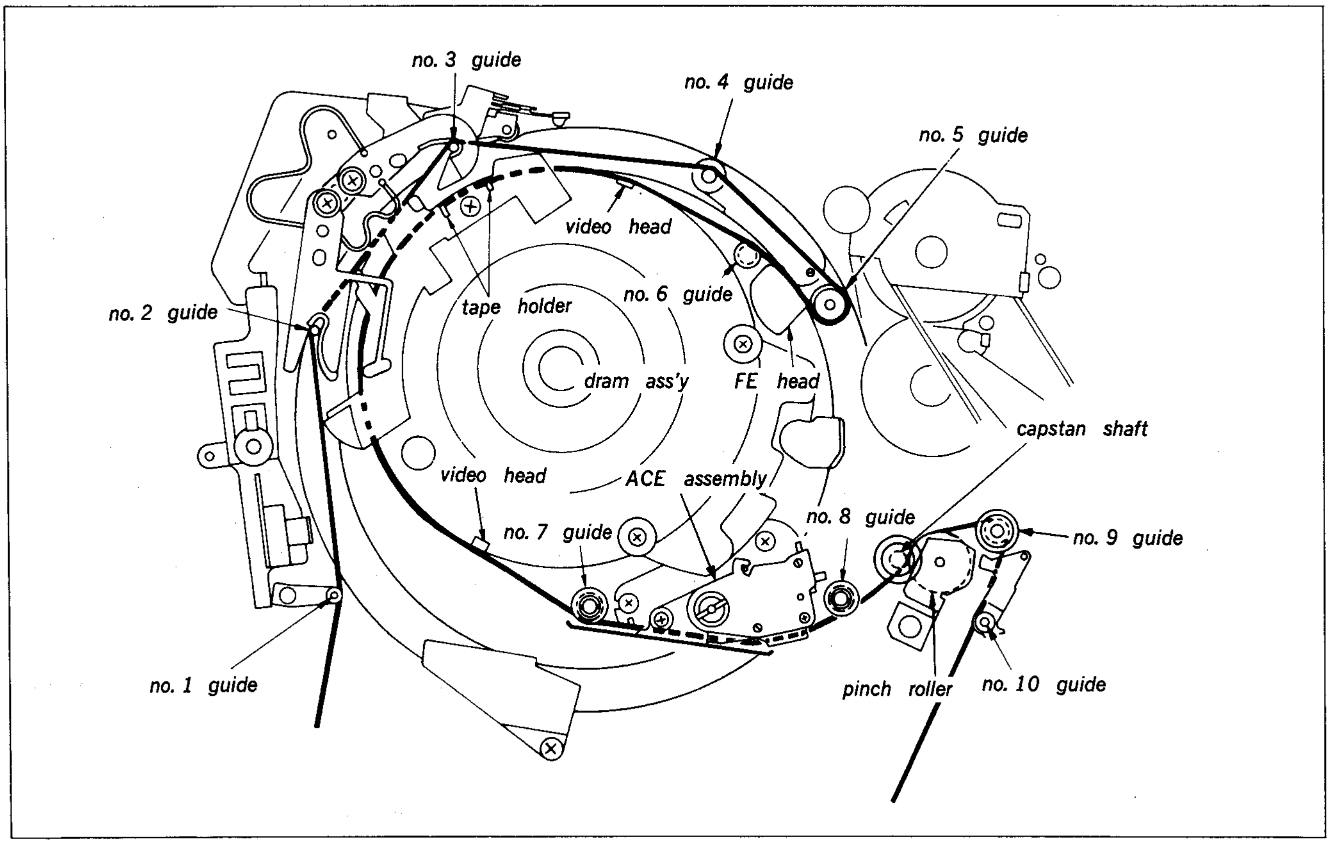

no. 3 guide
no. 4 guide
no. 5 guide
video head
tape holder
no. 6 guide
no. 2 guide
dram ass'y
FE head
capstan shaft
video head
ACE assembly
no. 7 guide
no. 8 guide
no. 9 guide
no. 1 guide
pinch roller
no. 10 guide

Fig. 2-1. Parts requiring cleaning

2-2. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, accoring to user's operating hours.

		Operating Hours (H)											
Maintenance & Check		Replacement Part No.	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Transportation System	Cleaning of tape transportation system	——	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE ass'y	——	○	○	○	○	○	○	○	○	○	○	
	Cleaning & degaussing of video disk ass'y	——	○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Driving System	Loading belt (timing belt)	3-684-264-01	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	This cleaning must be done whenever a repair is made.
	Cleaning of iron core and opening of solenoid	——	—	—	—	○	—	—	—	○	—	—	Wipe iron core and opening of solenoid with dry cloth.
Performance Confirmation	Abnormal sound		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension		—	☆	—	☆	—	☆	—	☆	—	☆	Confirmation must be made according to section 3-13. Specified value: adjust to 34±3g•cm (When measured with torque cassette tape)
	Confirmation of brake system		—	☆	—	☆	—	☆	—	☆	—	☆	
	Confirmation of record & playback functions		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 80±5g•cm (SL-0003C)

○ Cleaning ★ Replacement ☆ Confirmation

Note:
On overhaul
When overhauling the unit, replace parts as indicated in the above table.

2-3. STATE OF WEAR OF VIDEO HEADS CHECK

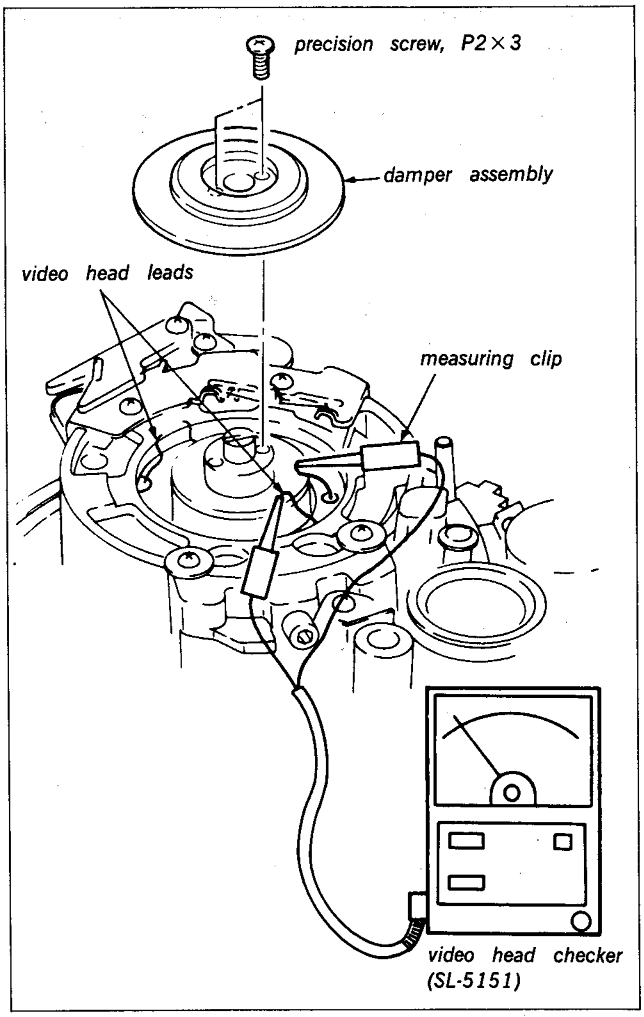
As the accuracy of the check depends on the state of the heads and precision of the checker the results should be taken only as an indication of the state of wear.

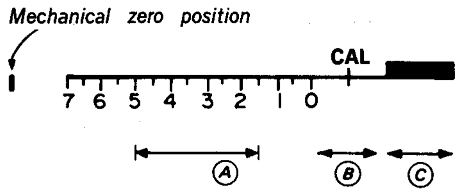
[Adjustment of video head checker]

1) Mechanical zero
   Verify that the pointer of the video head checker is at the mechanical zero position. If it is not at this position adjust the mechanical zero control.
2) Battery voltage check
   Set the MODE switch to "BATT" and set the POWER switch to "ON". The deflection of the pointer should be within the range marked "BATT". If not, replace the battery (use a 6F22 battery) as follows.
3) Calibration check
   Set the POWER switch to "ON" and the MODE switch to "CAL" then adjust the CAL control so that the pointer is on the CAL mark.
   Note 1: Be sure to carry out this adjustment whenever the RANGE switch is changed.
   Note 2: Be sure to check CAL before measuring the head and proceed the measurement after adjusting CAL, if CAL is not properly set.

[Method of measurement]

1) Remove the two screws that hold the damper assembly in place, then remove the damper assembly.
2) Detach the lead wires on the 2 video heads.
3) Attach the measuring clips to the head leads.
   Be sure to separate the leads by at least 1.5 cm.
4) Set RANGE switch to "B" and MODE switch to "MEAS".
   The pointer will deflect to indicate the state of wear of the heads.
   Note: The deflection for the 2 video heads may be different, so be sure to measure both.





Ⓐ : *Deflection when heads are O.K.*
Ⓑ : *Deflection when heads need replacing.*
Ⓒ : *Deflection when heads are worn.*

MEASURED VALUE

3. CHECK ADJUSTMENT AND REPLACEMENT PROCEDURES

3-1. PEPLACEMENT OF ROTATING HEAD DISK ASSEMBLY

3-1-1. Removal of the Rotating Head Disk Assembly (Fig. 3-1)

1) Remove the adjustment plates 2 and 3 ❶ in accordance with the repalcement of the drum assembly 1), 2) and 3) described in 3-3-1.
2) Remove the two precision screws ❷ then remove the damper assembly ❸.
3) Use a hexagonal wrench to remove the hexagonal socket bolt ❹ then remove the upper drum assembly ❺.

   Note:

   Turn the upper drum to remove, being careful not to move the adjusting plate. Movement of the adjusting plate will have a great effect on the tape path, so caution in required.
4) Unsolder the rotating head disk ❻ relay board four red and white leads) ❼.
5) Remove the two hexagonal socket bolts ❽ then remove the rotating head disk assembly ❻.

   Note:

   Be careful not to touch the head tip with the hand or bang anything against it.

3-1-2. Mounting of the Rotating Head Disk Assembly (Fig. 3-1)

1) Insert rotating head disk ❻ in place being careful of the direction so that the red and white leads are in the right places.
2) Tighten hexagonal socket bolts ❽ and solder the lead wires.

Note:

Be careful to solder the lead wires correctly and not to break any wires.

3) Attach the upper drum being careful (as during removal) not to move the adjusting plate. While pressing the two points that determine the height tighten hexagonal socket bolt ❹.

   Note:

   When inserting the upper drum, be careful that it does not touch the head tip.

Note:

When replacing the rotating drum head, it can happen that the rotating head disk assembly will be hard to remove. In such a case, remove it using the method explained below (Fig. 3-2).

1) Remove the hexagonal socket bolts ❶ that hold the rotating head disk assembly in place.
2) When the head disk is jammed on tight and is hard to remove, screw the hexagonal socket bolts removed in step ❷ into the threaded holes removed from the original holes by 90°. Tighten them a little at a time.

The head disk will be lifted up by the two screws and will come off easily.

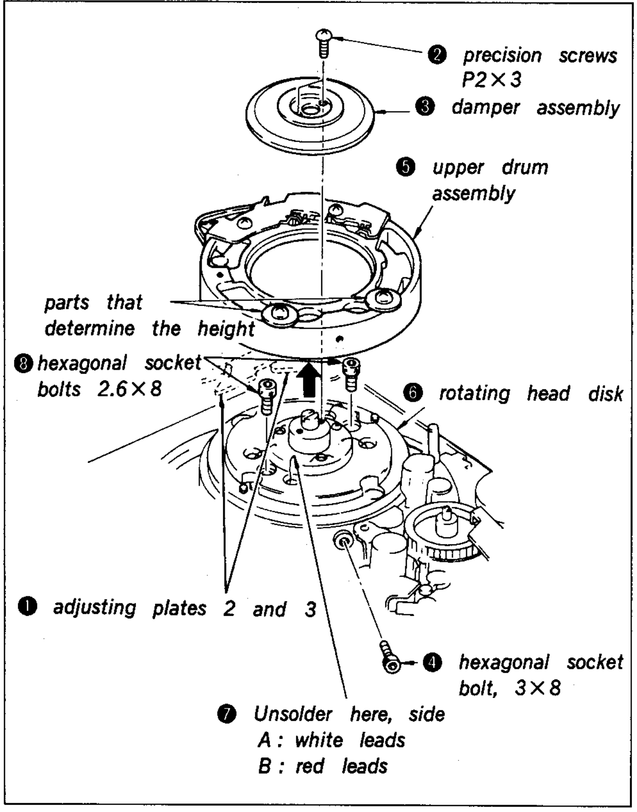

❷ precision screws P2×3
❸ damper assembly
❺ upper drum assembly
parts that determine the height
❽ hexagonal socket bolts 2.6×8
❻ rotating head disk
❶ adjusting plates 2 and 3
❹ hexagonal socket bolt, 3×8
❼ Unsolder here, side
A : white leads
B : red leads

Fig. 3-1. Removal of the rotating head disk assembly I

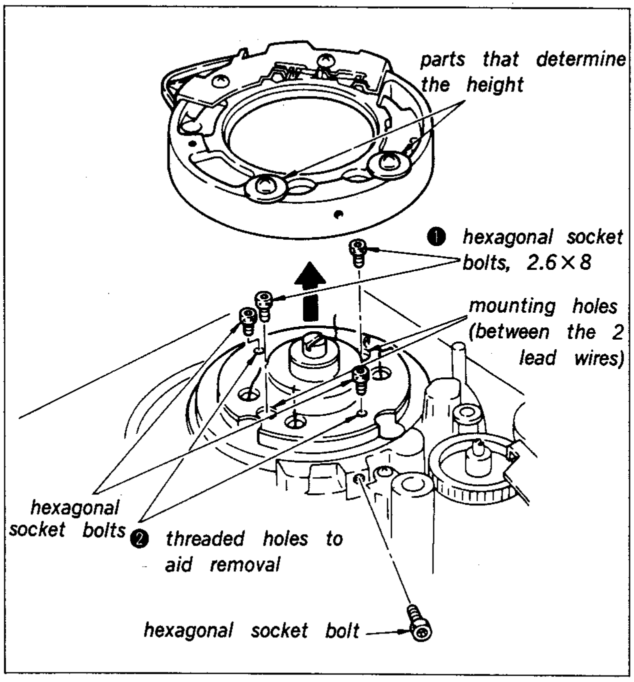

parts that determine the height
❶ hexagonal socket bolts, 2.6×8
mounting holes (between the 2 lead wires)
hexagonal socket bolts
❷ threaded holes to aid removal
hexagonal socket bolt

Fig. 3-2. Removal of the rotating head disk assembly II

3-2. VIDEO HEAD DIHEDRAL CHECK AND ADJUSTMENT

This adjustment is generally unnecessary but it is sometimes necessary when the video head disk is replaced. (The video head disk used for maintenance has been precision adjusted at the factory using a microscope and almost never needs to be readjusted).

When judging whether the video head dihedral angle is correct the alignment tape is played back. When this is done the tracking control knob must be in the centering position. If the check is done with this knob in other than the center click position (if the tracking is off-center) even if the dihedral angle is correct the picture will be reproduced as if it were off.

Before this adjustment is performed, the ACE assembly position adjustment (refer to the section where the tape path adjustment is described) must be completed.

[Method of checking]

With the tracking control knob set to the center click position play back the monoscope section of the alignment tape. Check to see if any of the vertical monoscope lines immediately below the switching pulse are reproduced double. If not the dihedral angle is correct and does not have to be adjustment. If perform the adjustment as explained below.

[Method of adjustment]

1) As shown in Fig. 3-3. screw two dihedral angle adjustment screws (SL-0013 in the list of fixtures and tools) into the adjustment screw holes on the side on which the red lead wires from the video head are connected until the top of the screw is level with the video head disk. (If they are not screwed in far enough, the video head disk will not turn past the point where the top of the adjustment screw strikes the upper drum. Conversely, if it is screwed in too far, the head base will be moved, throwing the video head dihedral angle way off.)
   The side on which the white lead wires are connected is the reference side and must not be moved.
2) Screw one of the two adjustment screws in a little bit farther until resistance is felt. Beyond this point turning the screw still farther will move the video head adjusting the dihedral angle.
3) With the adjustment screws in place play the monoscope signal section of the alignment tape and see how the lines are reproduced. If the verical lines are split apart more than before turn the screw which was screwed in more tightly counterclockwise to loosen it then adjust by tightening the other screw.
4) After the adjustment is completed remove the adjustment screws and play the tape again to reconfirm that the adjustment is correct.

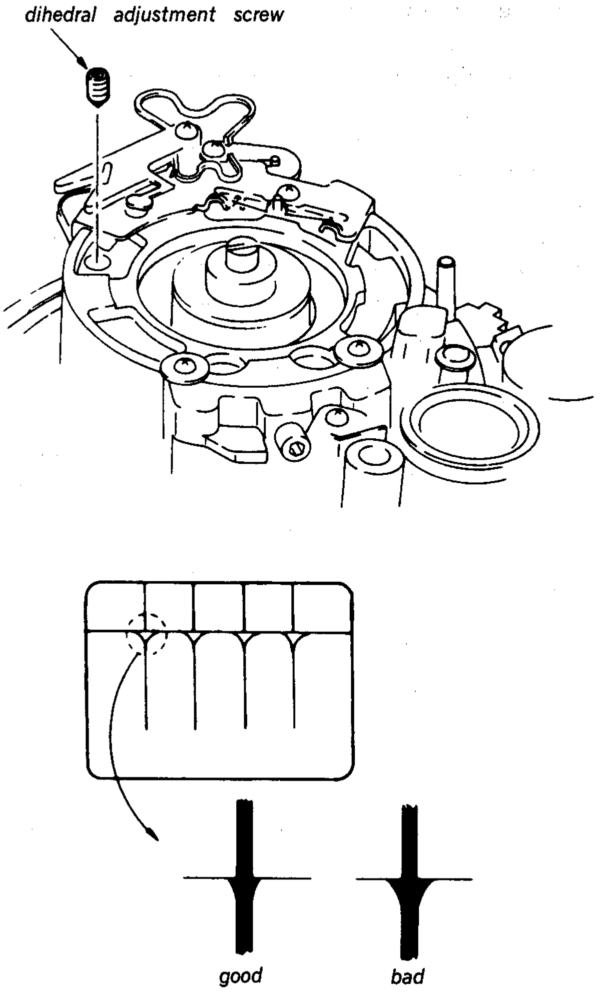


Fig. 3-3. Video head dihedral adjustment

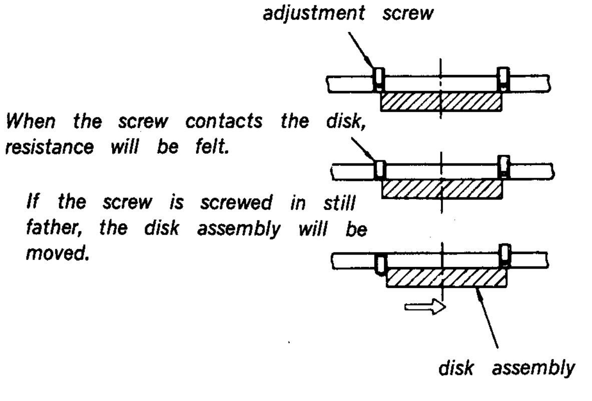

adjustment screw
When the screw contacts the disk, resistance will be felt.
If the screw is screwed in still father, the disk assembly will be moved.
disk assembly

Fig. 3-4.

3-3. REPLACEMENT AND ADJUSTMENT OF THE DRUM ASSEMBLY

3-3-1. Replacement of the Drum Assembly

1) Measure the gap Ⓐ between adjusting plate 2 and 3 and the upperdrum holder section and record the measurement.

   Note :

   The position where the adjusting plate is mounted has a large effect on the tape path, so this measurement must be performed.

2) Measure the gap Ⓑ between adjusting plate 2 and 3 and the upperdrum holder section, and record the measurement.

   Note :

   The position where the adjusting plate is mounted has a large effect on the tape path, so this measurement must be performed.

3) Remove the two screws ❶ shown in Fig. 3-5, then remove the adjusting plates 2 and 3 ❷.
4) Remove the three connectors ❸ from the rear of the chassis as shown in Fig. 3-6.
5) Remove the three drum mounting screws ❹ from the rear of the chassis, then remove the main body of the drum assembly ❺. After the replacement has been completed, adjust the drum path.

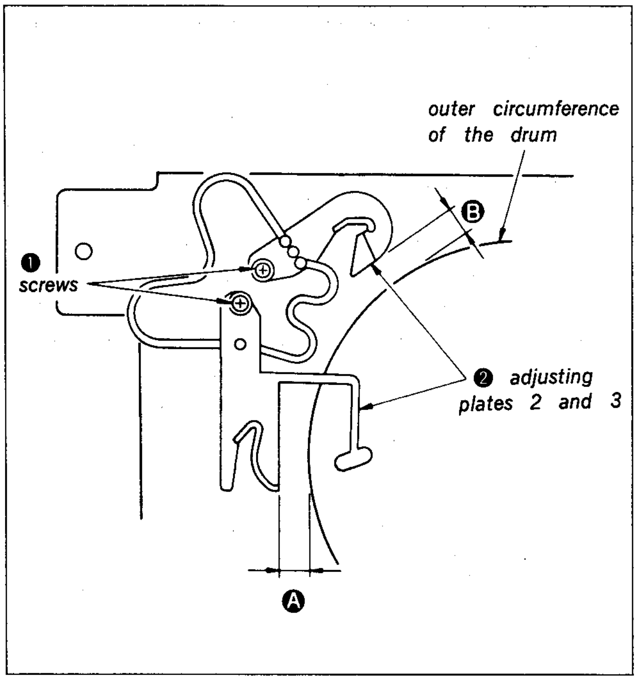

outer circumference of the drum
Ⓑ
❶ screws
❷ adjusting plates 2 and 3
Ⓐ

Fig. 3-5. Measurement of the position of adjusting plates 2 and 3

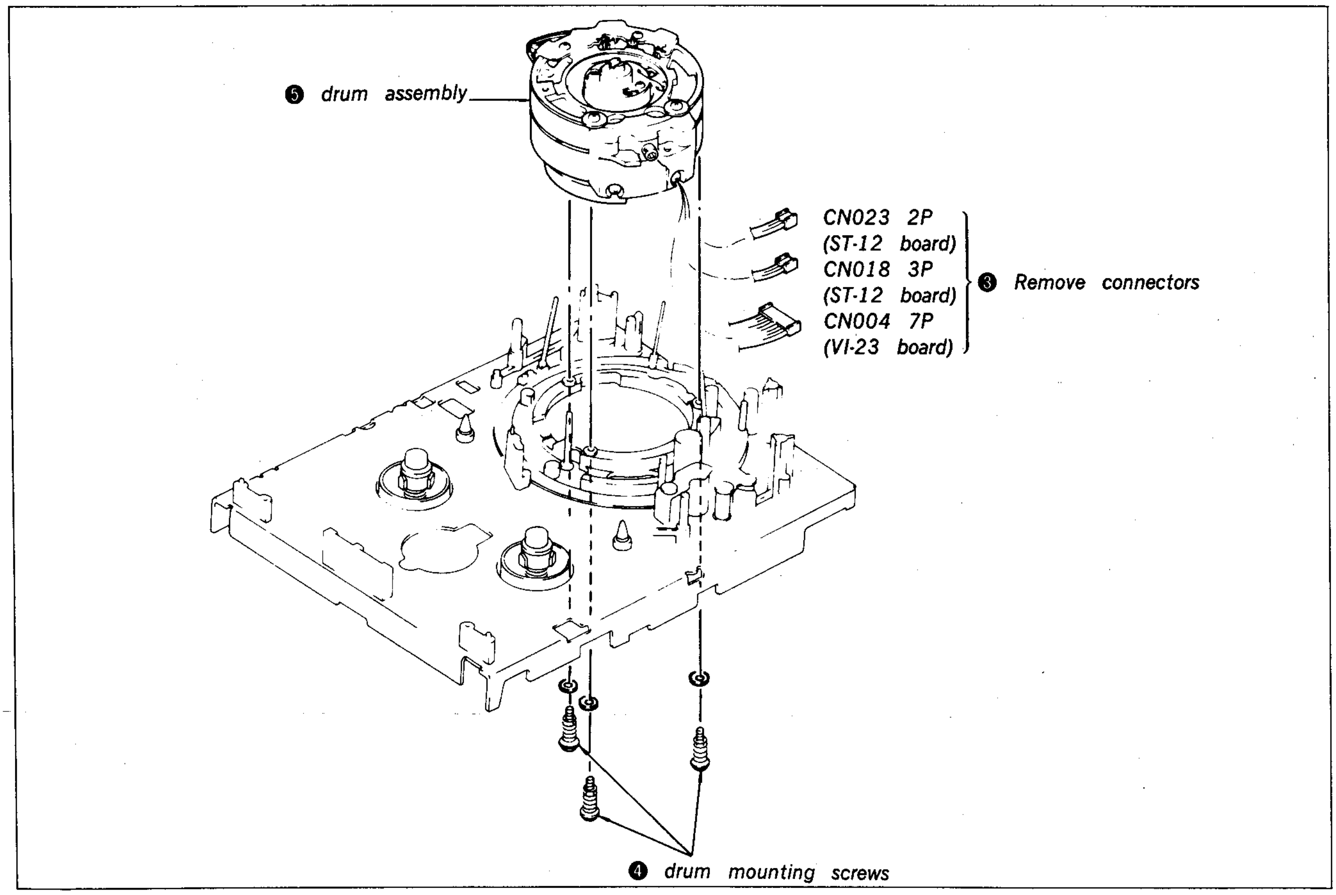

❺ drum assembly
CN023 2P (ST-12 board)
CN018 3P (ST-12 board)
CN004 7P (VI-23 board)
❸ Remove connectors
❹ drum mounting screws

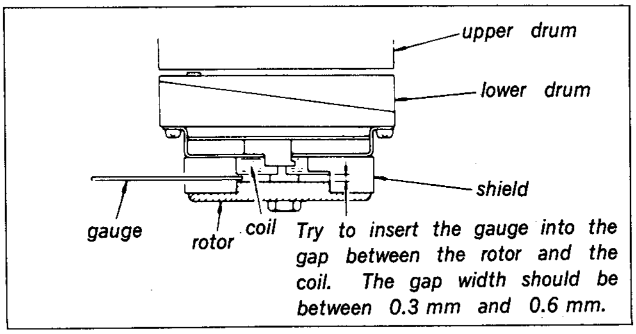
Fig. 3-6. Removal of the drum assembly

3-3-2. Adjustment of the Motor Gap when Replacing the Drum Assembly

After replacing the drum assembly adjust the gap between the motor rotor and the coil to 0.3 mm 0.6 mm (Fig. 3-7).

[Procedure]

1) When re-assembling the drum use the spacers which were removed to produce a gap of between 0.3 mm and 0.6 mm. Measure the gap using the gauge and maintenance use. One side of the gauge in 0.3 mm and the other side is 0.6 mm. If the gap is adjusted correctly the 0.3 mm side should fit in and the 0.6 mm side should not.
2) If this tails to give the correct gap width, do not use the spacers which were removed; instead, use a combination of the accessory four spacers (0.3 mm) to obtain the correct width.

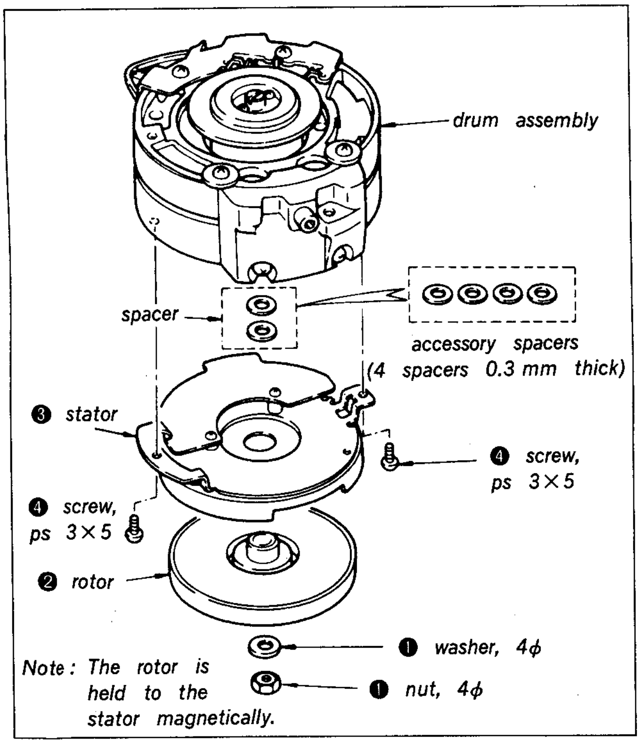

upper drum
lower drum
shield
gauge
rotor
coil

Try to insert the gauge into the gap between the rotor and the coil. The gap width should be between 0.3 mm and 0.6 mm.

Fig. 3-7. Checking the motor gap width after replacing the drum assembly

Removal of the stator and rotor when replacing the drum

1) Remove the nut and washer ❶.
2) Remove the rotor ❷ from the stator ❸.
3) Remove the two screws ❹, then remove the stator ❸ from the main body of the drum.


drum assembly
spacer
accessory spacers
(4 spacers 0.3 mm thick)
❸ stator
❹ screw, ps 3×5
❹ screw, ps 3×5
❷ rotor
❶ washer, 4φ
❶ nut, 4φ

Note: The rotor is held to the stator magnetically.

Fig. 3-8. Removal of the stator and rotor when replacing the drum

3-4. REPLACEMENT OF THE CAPSTAN MOTOR

3-4-1. Removal of the Capstan Motor (Fig. 3-9)

1) Remove the two screws (+PW2 × 6) ❶ and screw (+P2.6 × 5)❷.
2) Remove the capstan motor ❸ from the rear of the mechanical chassis.
3) Remove screw (+P2 × 4) ❹, and remove the rotor holder ❺.
4) Remove three claws, and remove capstan cover ❻.
   Note:
   When the capstan motor has been removed or replaced, check the tape path once.

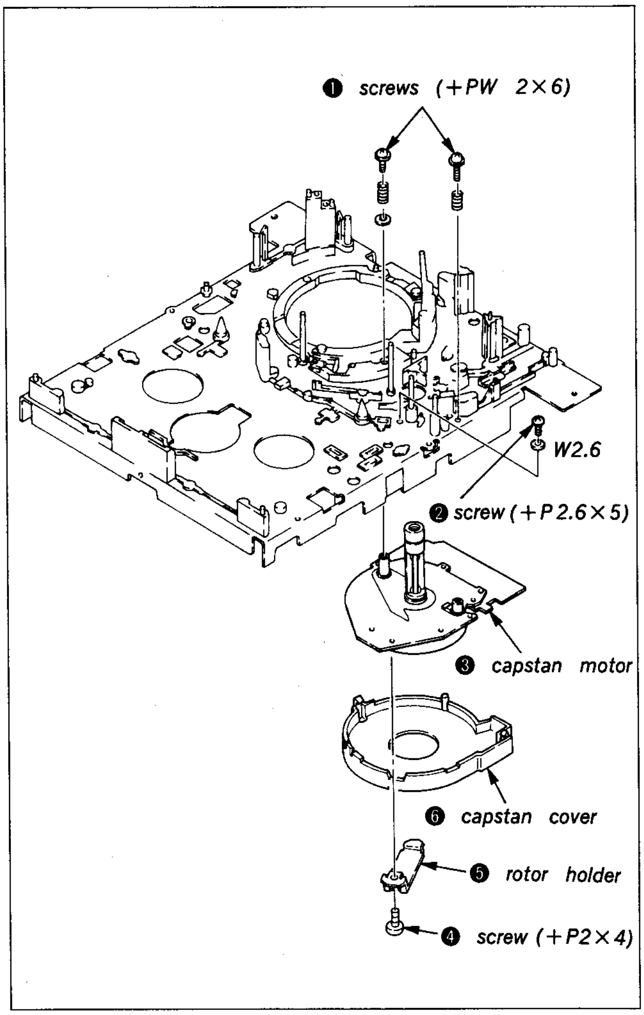

❶ screws (+PW 2×6)
W2.6
❷ screw (+P2.6×5)
❸ capstan motor
❻ capstan cover
❺ rotor holder
❹ screw (+P2×4)

Fig. 3-9. Removal of capstan motor

3-4-2. Capstan Shaft Verticality Adjustment

When the capstan motor has been replaced or removed, be sure to make the following adjustment.

1) Loosen clamping screws Ⓑ and Ⓒ.
2) Apply parallel plate (SL-0657 in the list of fixtures and tools) vertically to the capstan motor shaft and the No. 8 guide sleeve, as shown in Fig. 3-10.
3) Turn adjust screw Ⓐ until the capstan motor shaft becomes vertical.
4) Apply the jig to the capstan motor shaft and the No. 10 guide shaft of the pinch arm assembly in the vertical attitude as shown in Fig. 3-11.

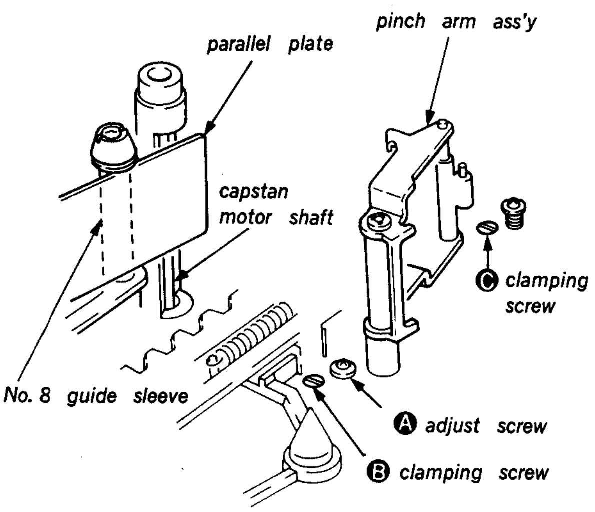

pinch arm ass'y
parallel plate
capstan motor shaft
Ⓒ clamping screw
No. 8 guide sleeve
Ⓐ adjust screw
Ⓑ clamping screw

Fig. 3-10.

5) Turn clamping screw Ⓒ until the capstan motor shaft becomes vertical, and clamp the capstan motor.
6) Apply the jig again as shown in Fig. 3-10, and check the verticality of the capstan motor shaft. If it is not accurately vertical, repeat the processes from 3).
7) Tighten clamping screw Ⓑ to clamp the capstan motor.
8) Make adjustment following the described tape path adjustment processes.

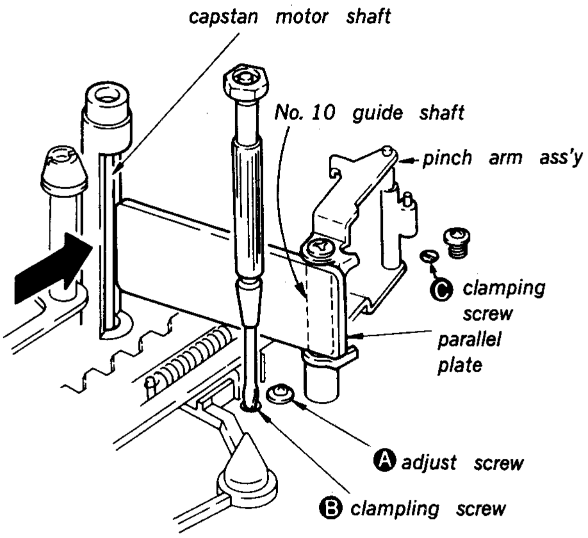

capstan motor shaft
No. 10 guide shaft
pinch arm ass'y
Ⓒ clamping screw
parallel plate
Ⓐ adjust screw
Ⓑ clampling screw

Fig. 3-11.

3-5. REMOVAL OF THE S COIL SENSOR (Fig. 3-12)

1) Remove the spring ❶.
2) Remove the claw ❷ in the direction of arrow Ⓐ, then pull the S coil sensor ❸ out.
3) Pull out the connector ❹ from CN5 on ST-12 board.

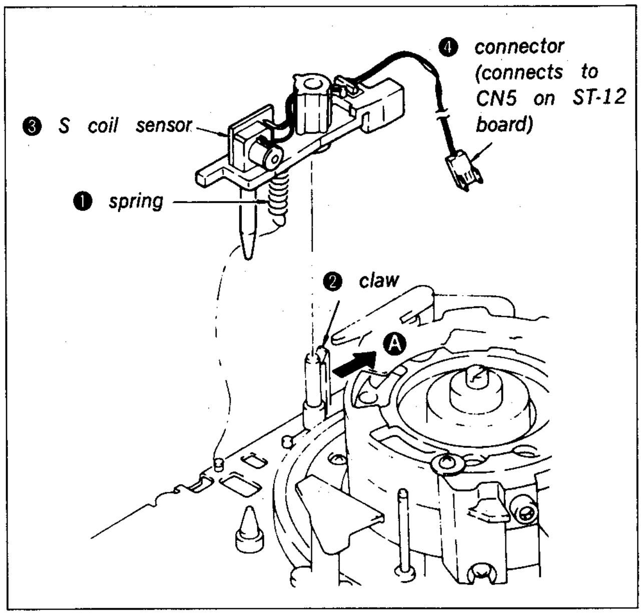

❹ connector (connects to CN5 on ST-12 board)
❸ S coil sensor
❶ spring
❷ claw
Ⓐ

Fig. 3-12. Removal of the S coil sensor

3-6. REMOVAL OF GEAR HOLDER (Fig. 3-13)

1) Remove FL cassette compartment assembly in accordance with 2-8 in SECTION 2.
2) Remove three claws ❶. (Easy to remove with flatblade screwdriver.)
3) Remove claw ❷ and open gear holder ❹ in the direction of arrow Ⓑ while taking precaution to the Ⓐ section.
4) Remove two claws ❸ and remove gear holder ❹. (When installing, install from claws ❸.)

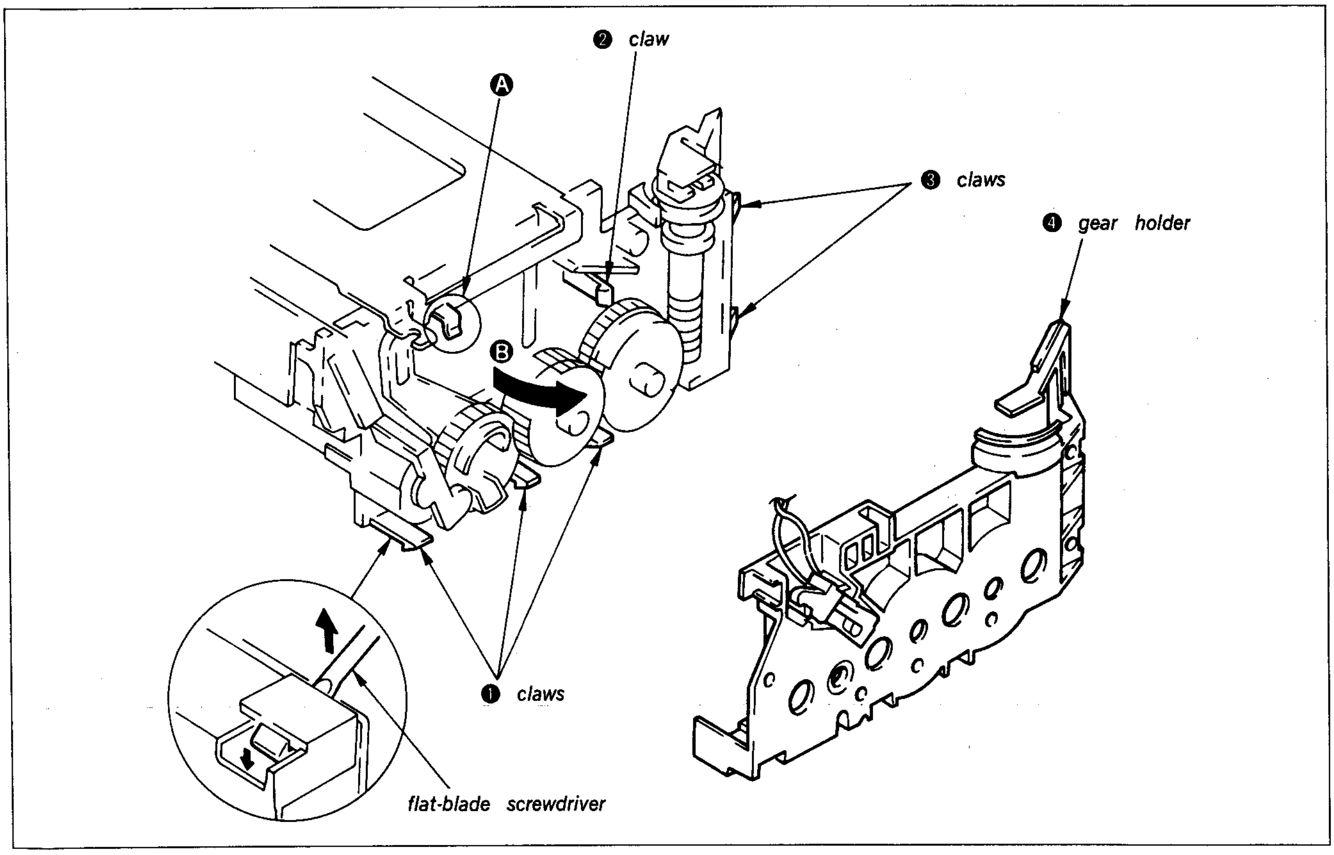

❷ claw
Ⓐ
❸ claws
❹ gear holder
Ⓑ
❶ claws
flat-blade screwdriver

Fig. 3-13. Removal of gear holder

3-7. ADJUSTMENT OF THE FL CASSETTE COMPARTMENT

3-7-1. Adjustment of the Position of the Right Gear of the FL Cassette Compartment Assembly

In the FL cassette compartment assembly the cassette holder must always move parallel to the mechanical chassis. The gear system is used to control the amount by which the cassette holder advances so that this will be the case. Consequently if the gears in this section slip out of mesh the next time the unit is assembled the gear mesh must be adjusted to the correct position otherwise the cassette will not feed properly.

[Adjustment Method of Right Gear Wheel Positioning (Phase)] (Fig. 3-14-A)

Preparation prior to adjustment

1) Remove gear holder in accordance with 3-6.
2) Remove the respective limiter gear assembly ❷ drive gear assembly ❸, and worm gear assembly ❹ from the right side plate.
3) Pull the base block toward you and draw the L groove (right side plate) of the fulcrum ❺ of the base block right side plate to the left edge (Fig. 3-14-A position)

Note:

Adjustment hereafter is carried out in above state.

Adjustment and Check

1) See to it that the fulcrum ❺ of the base block right side plate passes the slot of the drive arm (right) assembly.
2) Install the limiter gear assembly ❷, irrespective of the positioning hole ⓐ to engage with the drive arm (right) assembly ❶. (Regarding phase matching hole ⓐ, it is desirable, if possible, to come to the vicinity of Fig. 3-14-A).
3) Install drive gear assembly ❸ so that the fourth tooth of the drive gear assembly ❸ becomes into a straight line ⓔ with the shaft of the limiter gear assembly ❷ and drive gear assembly ❸.
4) Install worm gear assembly ❹.
5) Install the gear holder in reverse procedure of 3-6. Thereafter stop the drawing forward of the base block assembly.
6) Turn the flange ⓓ of the worm gear assembly ❹ in the direction of arrow unitl it stops.

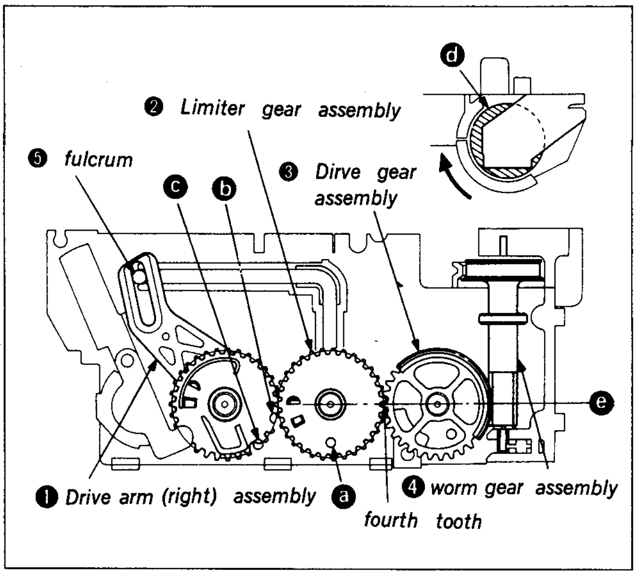


Fig. 3-14-A. Adjustment method of position (Phase) matching of right gear wheel

Note:

The chip ⓑ of the drive arm (right) assembly ❶ is a chip for phase matching during assembly, and chip ⓒ is a chip to determine the FL position during assembling.

Be sure that grease in not adhered to the belt pulley section of the ⓓ section of the worm gear assembly ❹.

[Adjustment Method of Position (Phase) Matching of Left Gear Wheel] (Fig. 3-14-B)

Preparation prior to adjustment

1) Remove drive arm (left) assembly from left side plate.
2) Pull the base block toward you, and draw the L groove (left side plate) of the fulcrum ❼ to the left edge (Fig. 3-14-B position)

Note:

Adjustment hereafter is carried out in the above state.

Adjustment and Check

1) Install the drive arm (left) assembly ❻ to that the third tooth of the drive arm (left) assembly becomes into a straight line ⓕ with the shaft of the drive arm assembly ❻ and middle gear when fulcrum ❼ is in Fig. 3-14-A position, the third gear of the drive arm (left) assembly automatically becomes into a straight line ⓕ.

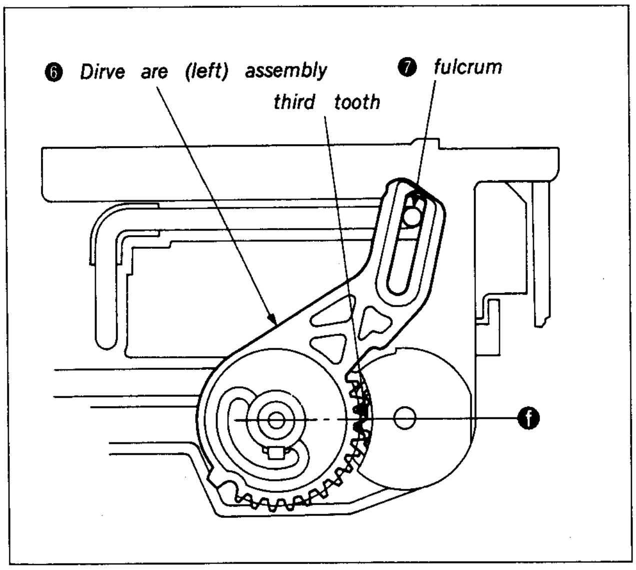

❻ Dirve are (left) assembly
❼ fulcrum
third tooth
ⓕ

Fig. 3-14-B. Adjustment method of position (phase) matching of left gear wheel

[Checking Method When Phase is in Matched State] (Fig. 3-14-C)

1) Turn worm gear assembly ❽ in the direction of arrow Ⓐ until stops.
2) Release base block ❾.
3) When the base block assembly ❿ is shifted in the direction of arrow Ⓑ, be sure that the base block assembly ❿ is returned in the direction of arrow Ⓒ. At this point, be sure that the base block assembly ❿ does not tilt and shifts.

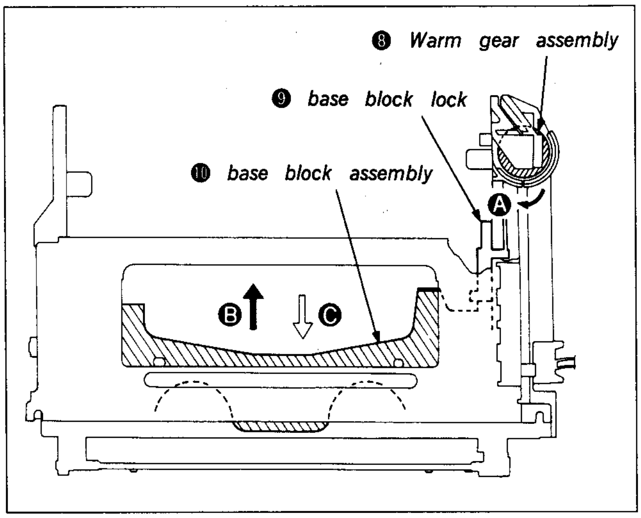

❽ Warm gear assembly
❾ base block lock
❿ base block assembly
Ⓐ
Ⓑ
Ⓒ

Fig. 3-14-C. Checlcing method when phase is in matched state

3-7-2. Cassette ON Switch Operation Check

[Method of checking]

When inserting a cassette into the FL cassette compartment assembly confirm that as the cassette is inserted the microswitch comes ON when the center of the drive roller is 7 to 13 mm from the end of the guide groove as shown in Fig. 3-15. (A clicking sound can be heard after the switch is pressed.)

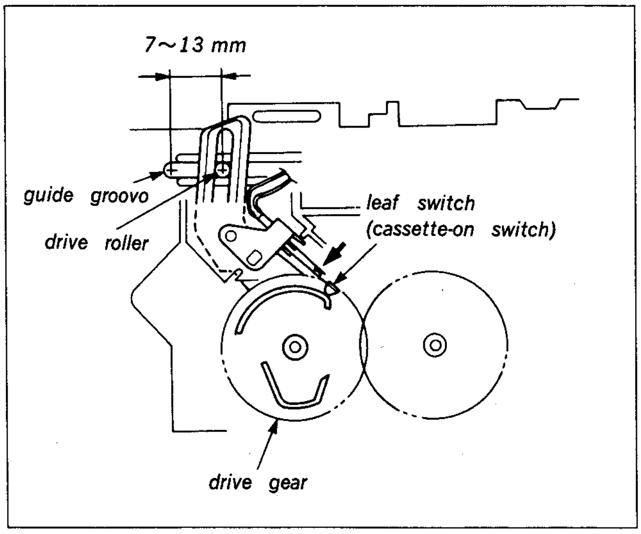

7~13 mm
guide groovo
drive roller
leaf switch (cassette-on switch)
drive gear

Fig. 3-15. Cassette ON switch operation check

3-7-3. Checking and Adjustment of the Cassette Door Assembly

[Method of checking]

With the door opening and closing arm returned all the way in the direction of arrow Ⓐ check to make sure that the door in vertical.

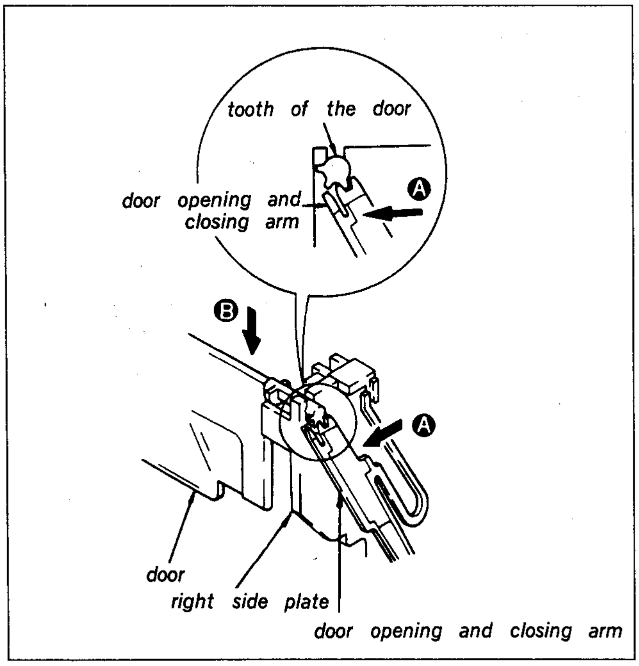

tooth of the door
door opening and closing arm
Ⓐ
Ⓑ
Ⓐ
door
right side plate
door opening and closing arm

Fig. 3-16. Adjustment of the position of the cassette door assembly

[Method of adjustment]

Check to make sure that the door opening and closing rack plate has returned all the way. Then close the door in the direction of arrow Ⓑ so that it is vertical and mesh the gears.

3-7-4. Mounting the FL Cassette Compartment Assembly (Fig. 3-17)

1) Hook the two holes ❶ of the FL cassette compartment assembly onto the mechanical chassis, then place the compartment in the specified position on the chassis.
2) Loosely tighten the four mounting screws ❷ of the FL cassette compartment assembly. Move the FL cassette compartment assembly forward and backward with respect to the mechanical chassis, set it in the correct position, then tighten the mounting screws ❷ all the way.
3) Connect the timing belt (loading belt) ❸ between the loading motor and the worm gear, then hold it in place with the planet gear holder ❹.
4) Insert the harness sticking ❺ out from the FL cassette compartments into connector ❺ CN3 on ST-12 board.

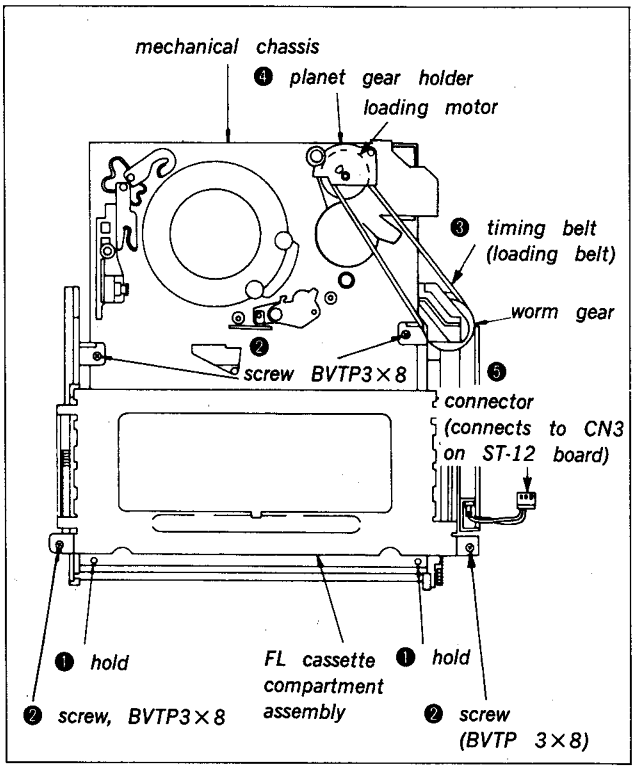
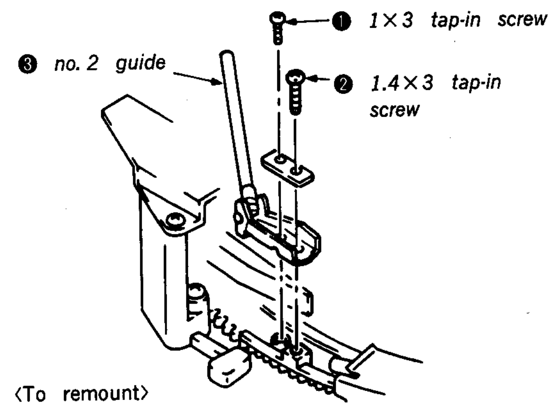

mechanical chassis
❹ planet gear holder
loading motor
❸ timing belt (loading belt)
worm gear
❷
screw BVTP3×8
❺
connector (connects to CN3 on ST-12 board)
❶ hold
❷ screw, BVTP3×8
FL cassette compartment assembly
❶ hold
❷ screw (BVTP 3×8)

Fig. 3-17. Mounting the FL cassette compartment assembly

3-8. REMOVAL OF THE No. 2 AND No. 3 GUIDES

3-8-1. Removal of the No. 2 Guide

1) Remove the 1×3 tap-in screw ❶.
2) Remove the 1.4×3 tap-in screw ❷.
3) Remove the No. 2 guide assembly ❸.


❶ 1×3 tap-in screw
❸ no. 2 guide
❷ 1.4×3 tap-in screw

⟨To remount⟩
1) *Loosely tighten the 1×3 tap-in screw.*
2) *Tighten the 1.4×3 tap-in screw all the way.*
3) *Adjust the 1×3 tap-in screw until the height is 35 mm.*
   After adjustment, lock the screw.
   Note: The no. 2 guide is up all the way.

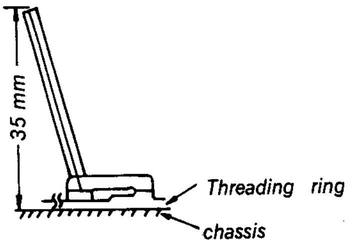
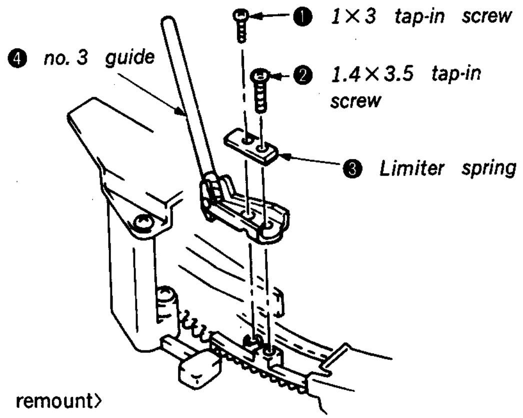

35 mm
Threading ring
chassis

Fig. 3-18. Removal of the no. 2 guide

3-8-2. Removal of the No. 3 Guide

1) Remove the 1×3 tap-in screw ❶.
2) Remove the 1.4×3.5 tap-in screw ❷.
3) Remove the limiter spring ❸.
4) Remove the No. 3 guide assembly ❹.


❶ 1×3 tap-in screw
❹ no. 3 guide
❷ 1.4×3.5 tap-in screw
❸ Limiter spring

⟨To remount⟩
1) *Loosely tighten the 1×3 tap-in screw.*
2) *Tighten the 1.4×3.5 tap-in screw all the way.*
3) *Adjust the 1×3 tap-in screw so that the height is 30 mm.*
   After adjustment, lock the screw.
   Note: The no. 3 guide is up all the way.

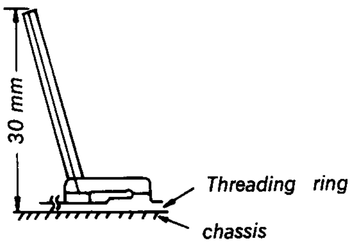

30 mm
Threading ring
chassis

Fig. 3-19. Removal of the no. 3 guide

3-9. REPLACEMENT AND ADJUSTMENT OF THE S THREADING RING

3-9-1. Perparation to Remove the S Therading Ring Removal of the ACE Assembly, FE Head and Threading Motor (Fig. 3-20)

1) Remove the cross-recessed head screw ❶.
2) Remove the No. 6 guide nut ❷.
3) Remove the No. 6 guide washer ❸.
4) Remove the No. 6 guide spacer ❹.
5) Remove the compression coil spring ❺.
6) Remove the two screws (PSW 2.6×12) ❻, then remove the ACE assembly ❼ and the FE head ❽.

Note:

Since the ACE assembly and the FE head are connected by a lead wire, be careful when removing them. It is not necessary to remove the compression coil spring below the ACE assembly, but be careful not to use it.

7) Remove the screw (PTPWH2×8) ❾ and the screw (B2.6×4)❿ then remove the L motor assembly ⓫ by pulling it up and out.
8) When ACE assembly ❼ only is to be removed, remove two screws (PSW 2.6×12) ❻ and the wiring of FE head ❽.

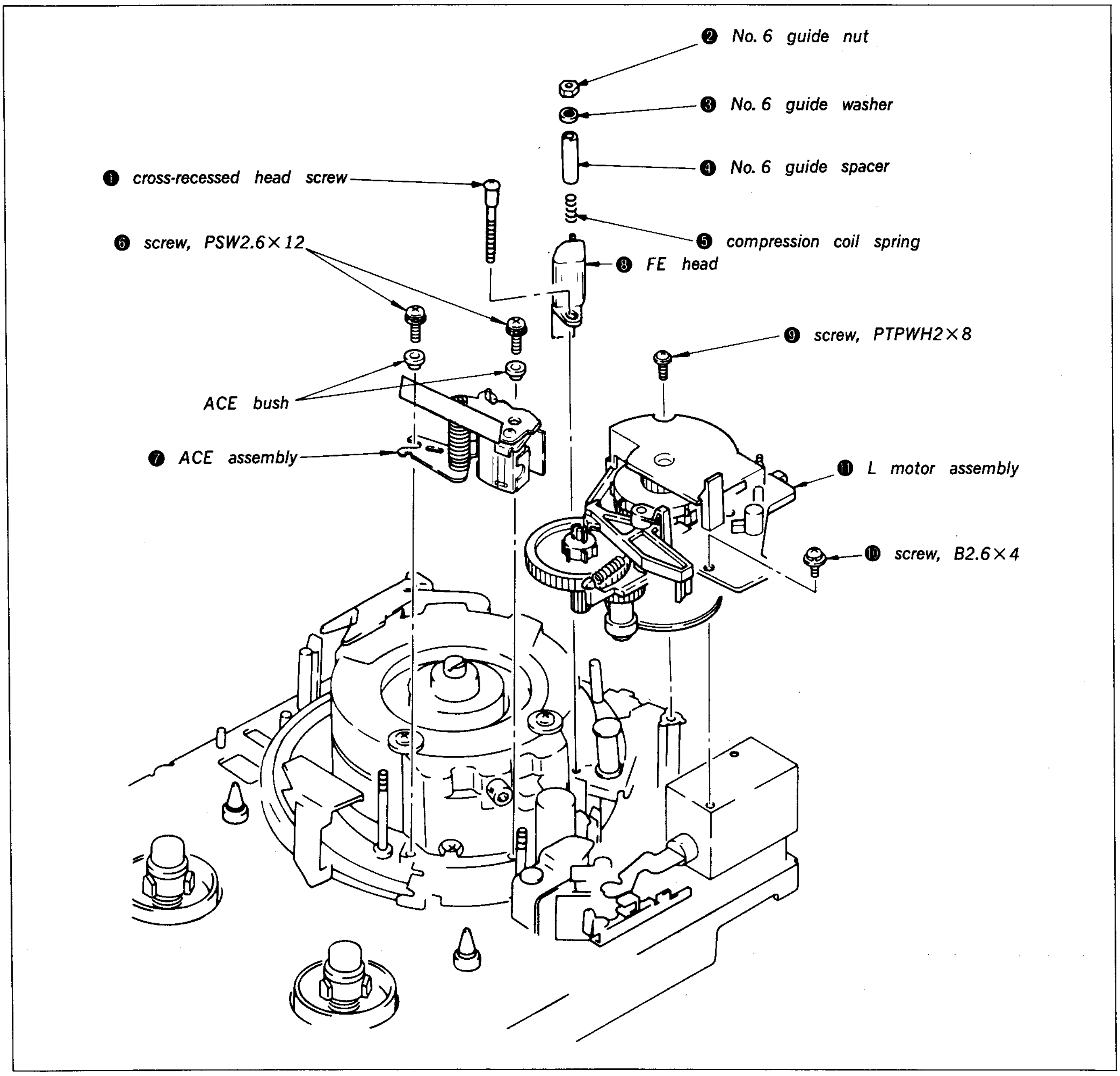

❷ No. 6 guide nut
❸ No. 6 guide washer
❹ No. 6 guide spacer
❶ cross-recessed head screw
❻ screw, PSW2.6×12
❺ compression coil spring
❽ FE head
❾ screw, PTPWH2×8
ACE bush
❼ ACE assembly
⓫ L motor assembly
❿ screw, B2.6×4

Fig. 3-20. Removal of the ACE assembly, FE head and TE motor assembly

Removal of Miscellaneous Parts (Fig. 3-21)

Proceeding in the same manner as in replacement of the drum assembly measure the width of the gap between the upper drum and the adjusting plates (Fig. 3-5).

1) Remove the two screws ❶, then remove the adjusting plates 2 and 3 ❷.
2) Remove the two screws ❸, then remove the tape holder assembly ❹.
3) Remove the screw ❺, then remove the guide plate ❻.
4) Remove the two screws (PTPWH 2×8) ❼ and the screw (2.6×24) ❽, then remove shuttle guide 2 ❾.
5) Remove the three screws (PTPWH 2×8) ❿ and the screw (2.6×24) ⓫. Then remove the two claws holding shuttle guide 1-YA ⓬ in place, and finally remove shuttle guide 1-YA ⓬.
6) Remove the slant base assembly ⓭.
7) Remove the pin link liner plate ⓮.

Note:

After removing the guide plate, do not thread or unthread a tape with the shuttle guide mounted.

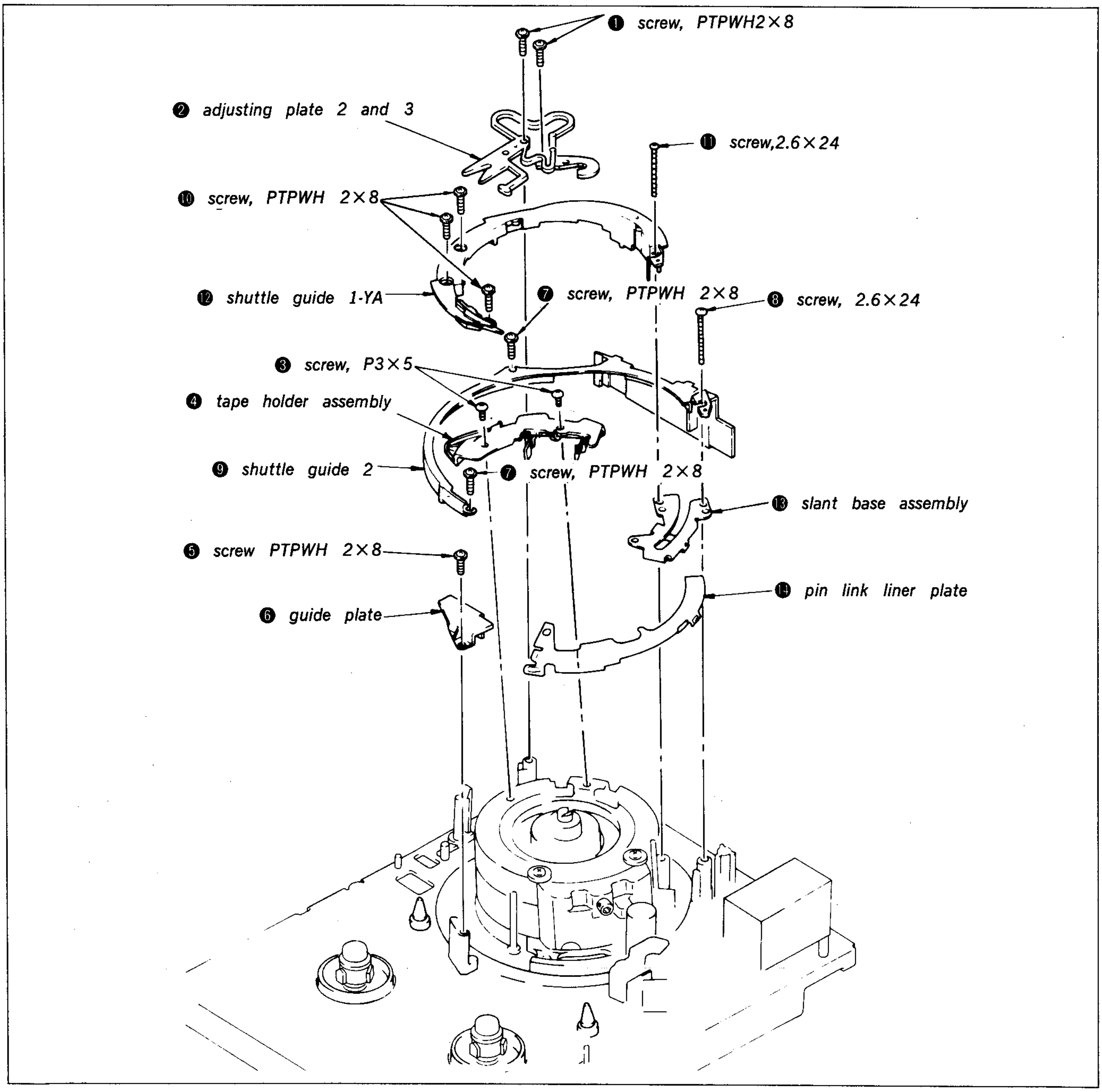

❶ screw, PTPWH2×8
❷ adjusting plate 2 and 3
⓫ screw,2.6×24
❿ screw, PTPWH 2×8
⓬ shuttle guide 1-YA
❼ screw, PTPWH 2×8
❽ screw, 2.6×24
❸ screw, P3×5
❹ tape holder assembly
❾ shuttle guide 2
❼ screw, PTPWH 2×8
⓭ slant base assembly
❺ screw PTPWH 2×8
⓮ pin link liner plate
❻ guide plate

Fig. 3-21. Removal of miscellaneous parts

3-9-2. Removal of the S Threading Ring (Fig. 3-22)

1) Turn the two stop wahers ❶ and remove the ring roller (B) ❷ and (C) ❸.
2) Remove the S threading ring ❹.

Note:
Once a stop washer has been removed, do not use it again.

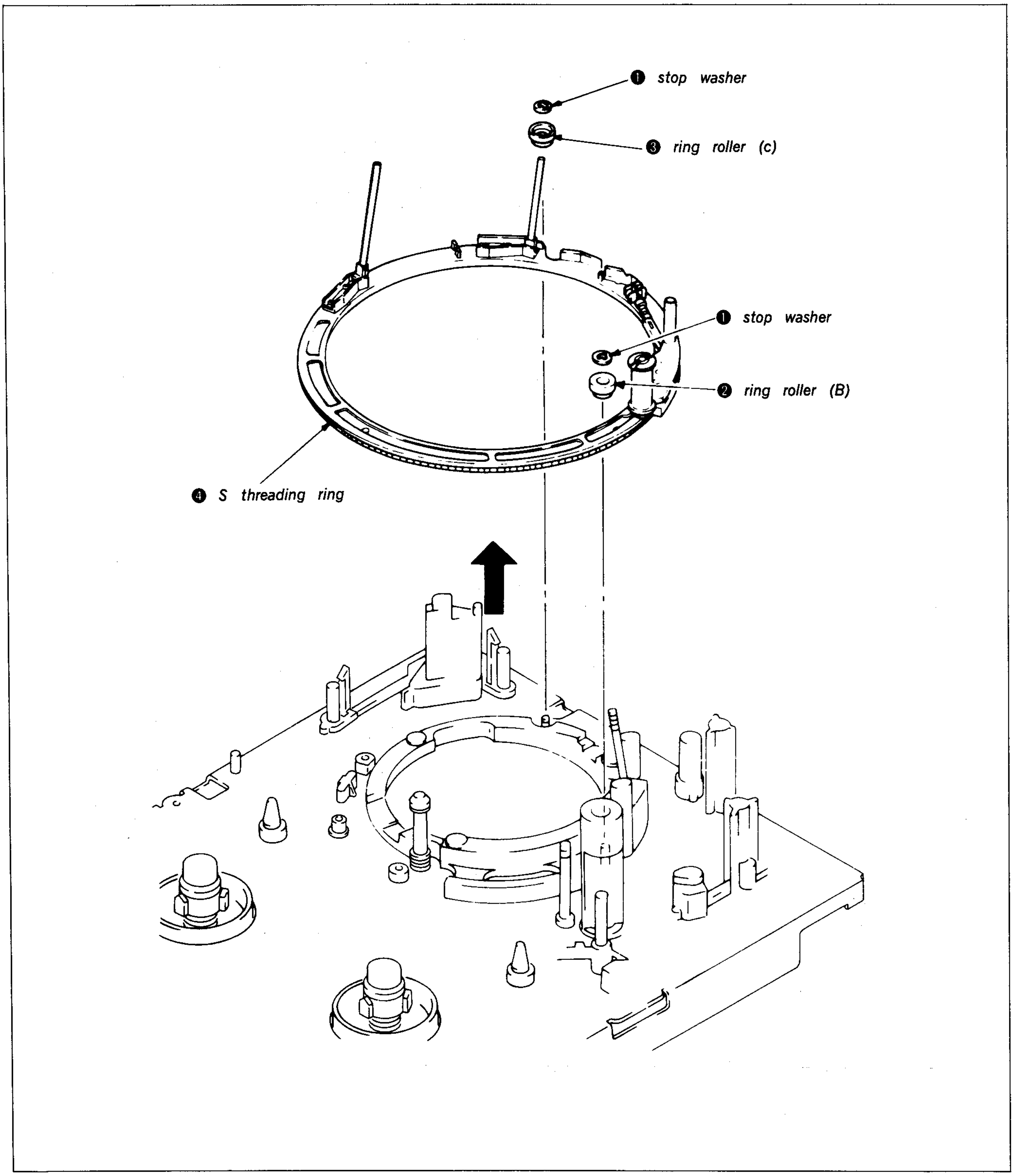

❶ stop washer
❸ ring roller (c)
❶ stop washer
❷ ring roller (B)
❹ S threading ring

Fig. 3-22. Removal of the S threading ring

3-9-3. S Tureading Ring Mounting and Position Adjustment (Fig. 3-23)

1) Set the slider gear assembly ❶ in the unthreading completed position.
   (Slider gear assembly ❶ set so that it is up against part T slider stop mold ❷.)
2) In this condition, fit the S threading ring ❸ into place, match the chassis hole (3ϕ) ❹ of part Ⓐ with the S threading ring hole (1.5ϕ) ❺ and mesh with the drive gear assembly ❻ teeth.
3) Attach ring roller (B) ❼ and fix in place with a stop washer ❽ .

   Note:

   After replacement and mounting are completed, adjust the ACE assembly as explained in the section on tape path adjustment.

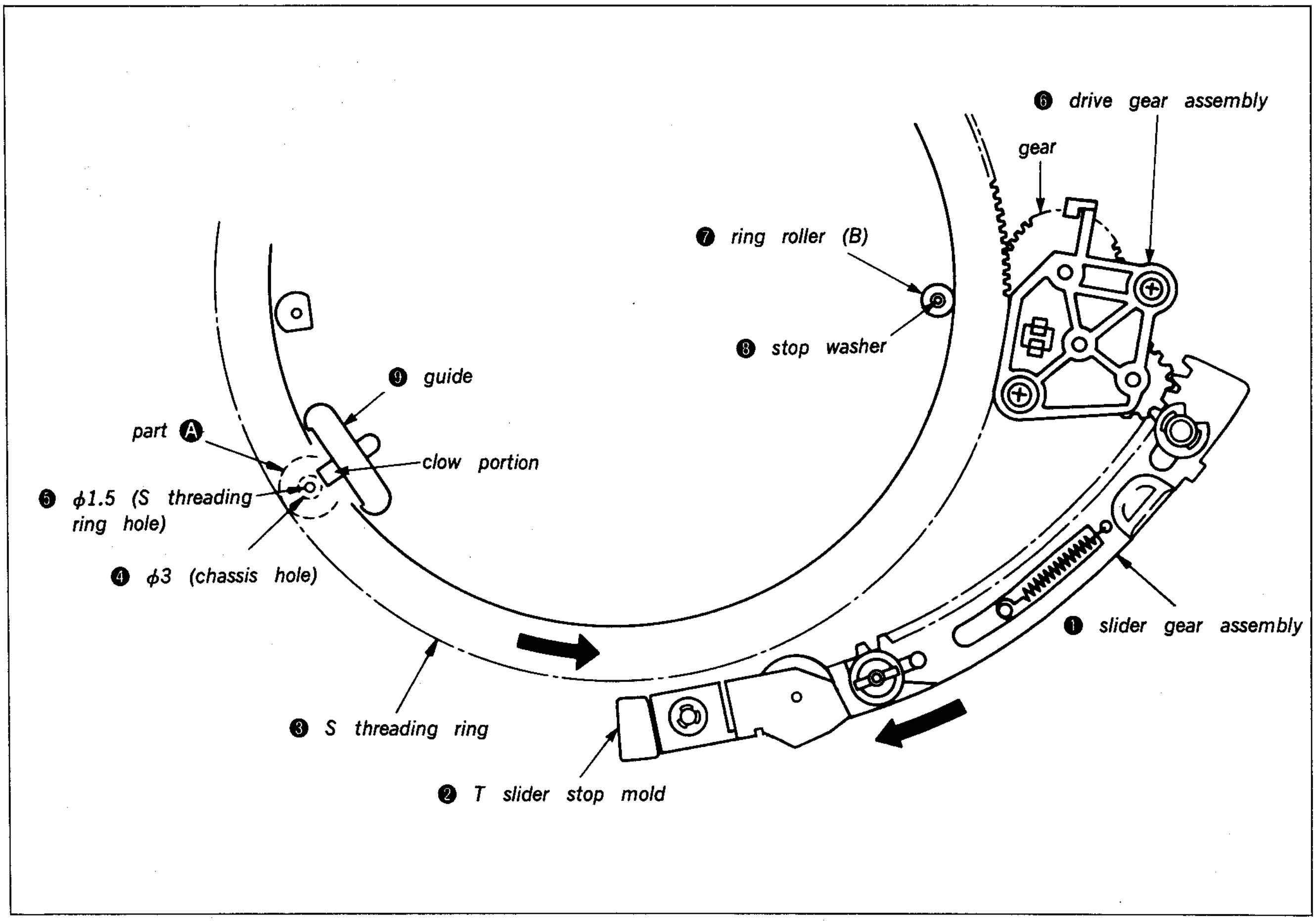

❻ drive gear assembly
gear
❼ ring roller (B)
❽ stop washer
❾ guide
part Ⓐ
clow portion
❺ ϕ1.5 (S threading ring hole)
❹ ϕ3 (chassis hole)
❶ slider gear assembly
❸ S threading ring
❷ T slider stop mold

Fig. 3-23. S threading ring position adjustment

3-10. PINCH SNAP-FIT LIMITER GAP CHECK AND ADJUSTMENT

[Method of checking]

1) Set in the threading completed condition.
2) With the plunger pushed in all the way, confirm that the thickness of the pinch snap-fit limiter gap is 0. 4 mm to 0.6 mm. If it is not, adjust as explained under [method of adjustment] below.

[Method of adjustment]

1) With the pinch solenoid in the absorbed condition (when the plunger is pushed in all the way) , loosen the adjustment screw ❶ .
2) Press the pinch limiter adjustment plate ❸ in the direction of arrow ⓐ a with an ordinary screwdriver ❷ , as in section Ⓐ in the diagram, and adjust until the thickness of the gap in 0.4mm to 0.6mm. Tighten the adjustment screw and then lock it to fix everthing in place.

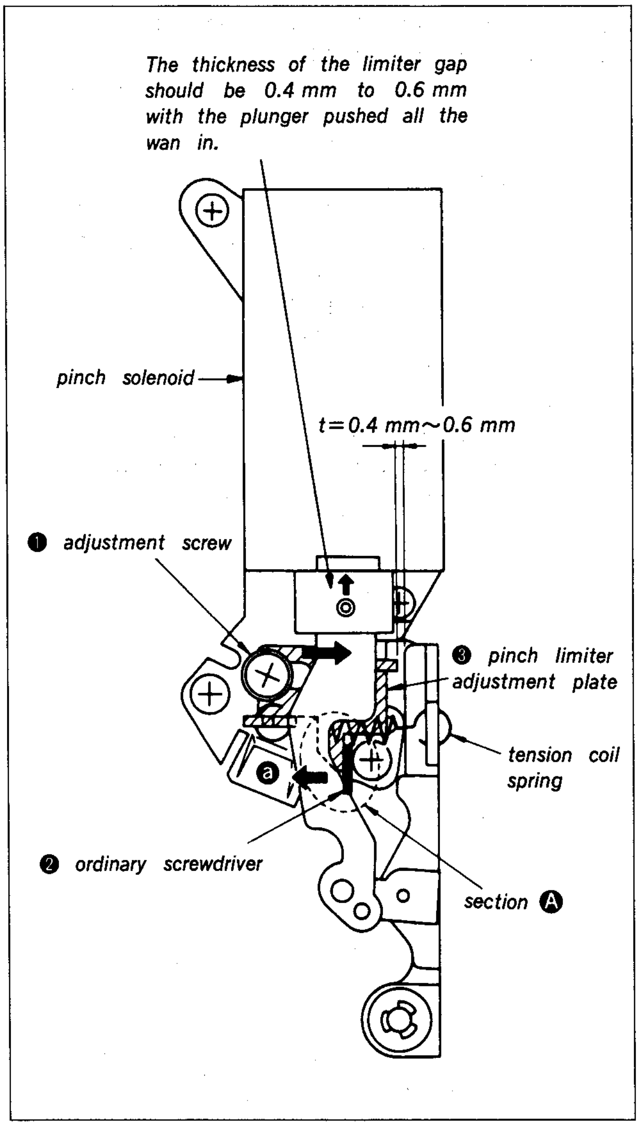

The thickness of the limiter gap should be 0.4 mm to 0.6 mm with the plunger pushed all the wan in.
pinch solenoid
t=0.4 mm~0.6 mm
❶ adjustment screw
❸ pinch limiter adjustment plate
tension coil spring
ⓐ
❷ ordinary screwdriver
section Ⓐ

Fig. 3-24. Pinch snap-fit limiter gap adjustment plate

3-11. THREADING END SWITCH AND T COIL SENSOR

3-11-1. Threading End Switch (TE Switch) Position Check and Adjustment

[Method of checking]

Turn the S threading ring manually. Check to make sure that. when the lock roller moves from above the straight line part of the notch in the ring (Fig. 3-25 section Ⓐ) to 1/3 of the way down it and back, the TE switch turns ON and OFF.
If the lock roller has to outside of this range before the switch will turn ON and OFF, adjust as explained below.

[Method of adjustment]

1) Set the lock roller between the top of the notch in the S threading ring and 1/3 of the way down it turn the TE switch in the direction of the arrow and, when the switch turns ON fix the TE switch in place.
2) When the adjustment is completed, repeat the check as described above [method of checking] .

[Removal]

1) Remove the tension coil spring ❷ that is attached to the Scoil sensor assembly ❶ , then remove the S coil sensor.
2) Remove the lock arm assembly ❸ in the direction of arrow Ⓐ .

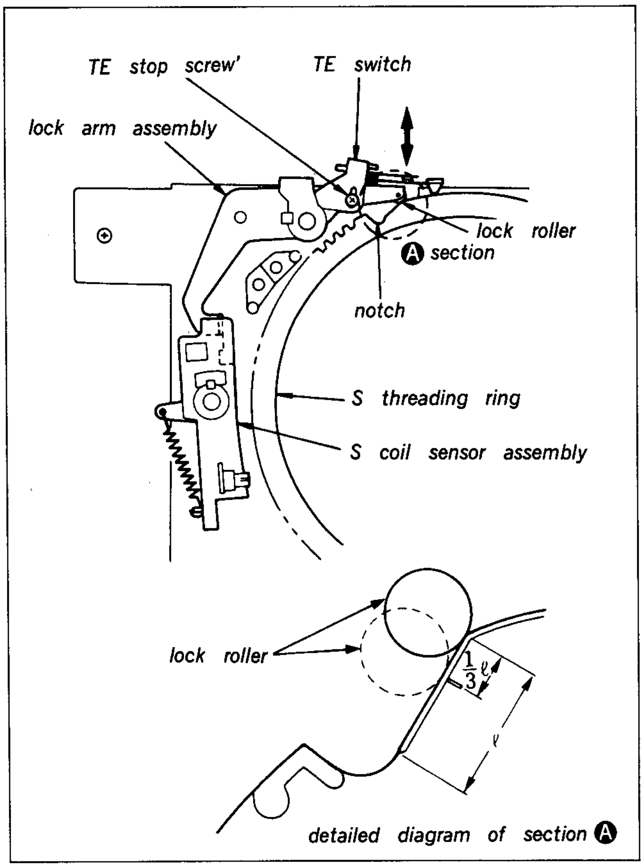

TE stop screw'
TE switch
lock arm assembly
lock roller
Ⓐ section
notch
S threading ring
S coil sensor assembly
lock roller
$\frac{1}{3}\ell$
ℓ
detailed diagram of section Ⓐ

Fig. 3-25. TE switch position adjustment

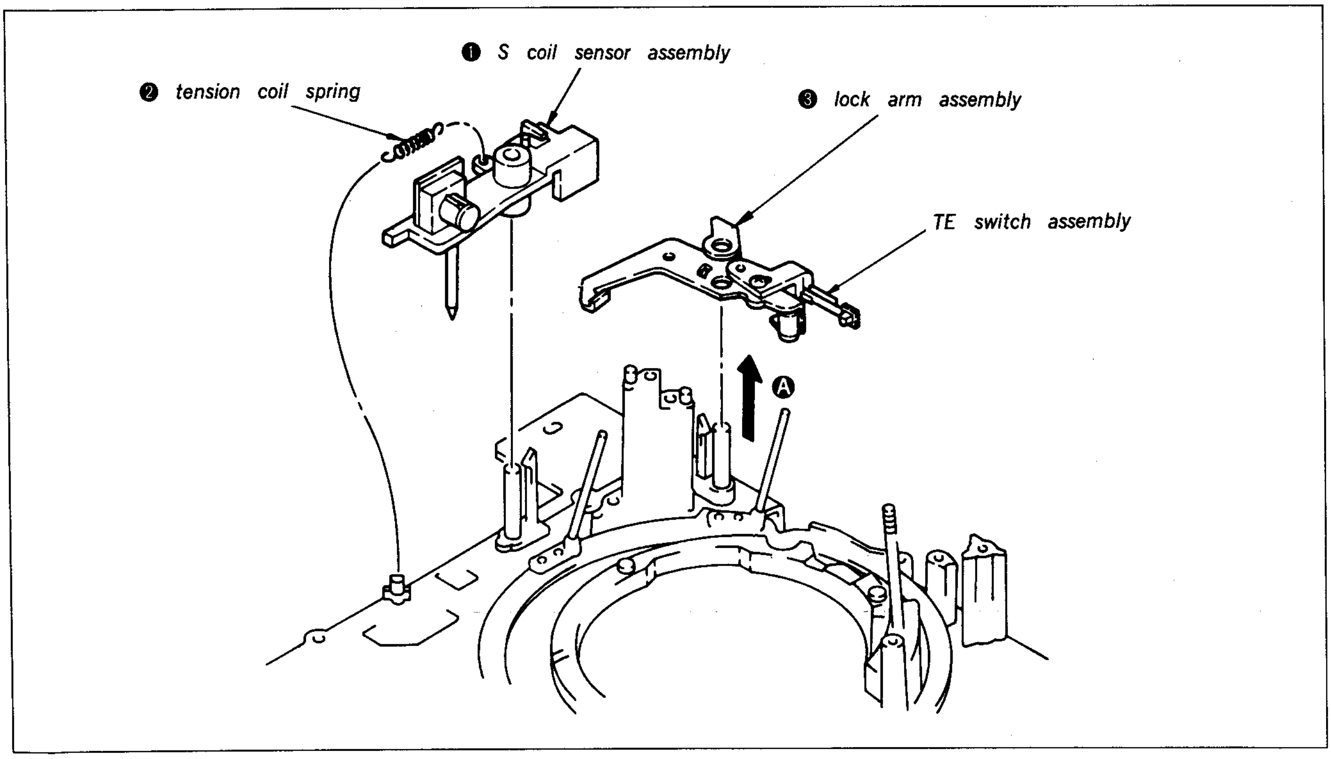

❶ S coil sensor assembly
❷ tension coil spring
❸ lock arm assembly
TE switch assembly
Ⓐ

Fig. 3-26. Removal of the TE switch assembly and lock arm assembly

3-11-2. T Coil Sensor Mounting and Operation Check

[Method of checking]

Confirm that T coil sensor link ❷ is pressed and T coil sensor ❸ moves in the direction of arrow Ⓑ when the T slider gear assembly ❶ is moved in the direction of arrow Ⓐ .

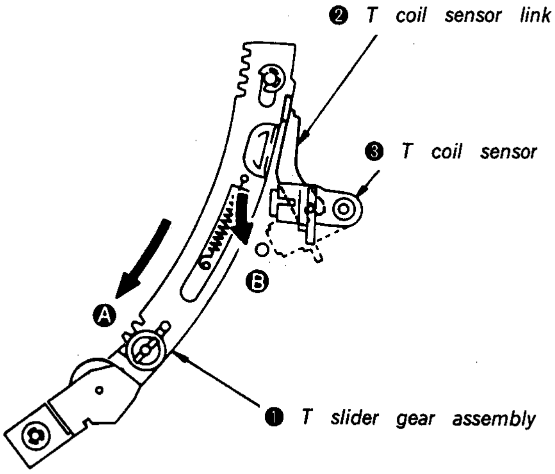

❷ T coil sensor link
❸ T coil sensor
Ⓑ
Ⓐ
❶ T slider gear assembly

Fig. 3-27. T coil sensor operation check.

[Method of mounting]

1) Place T coil sensor link ❶ in the prescribed position.
2) Match up the T coil sensor ❷ hole with the chassis shaft ❸ and insert. Place so that it engages with T coil sensor link ❶ .
3) Hook the tension coil spring ❹ on the T coil sensor and chassis claw.

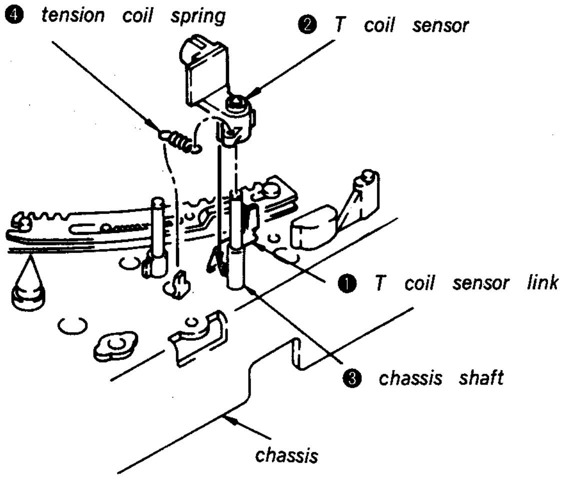

❹ tension coil spring
❷ T coil sensor
❶ T coil sensor link
❸ chassis shaft
chassis

Fig. 3-28. T coil sensor link and T coil sensor mounting.

3-12. REMOVAL AND ADJUSTMENT OF THE REEL BLOCK ASSEMBLY

3-12-1. Removal of the Reel Block Assembly

1) Place the set upside down.
2) Remove the four BVTP 3×8 tap-in screws ❶ .
3) Remove the reel block assembly ❷ .

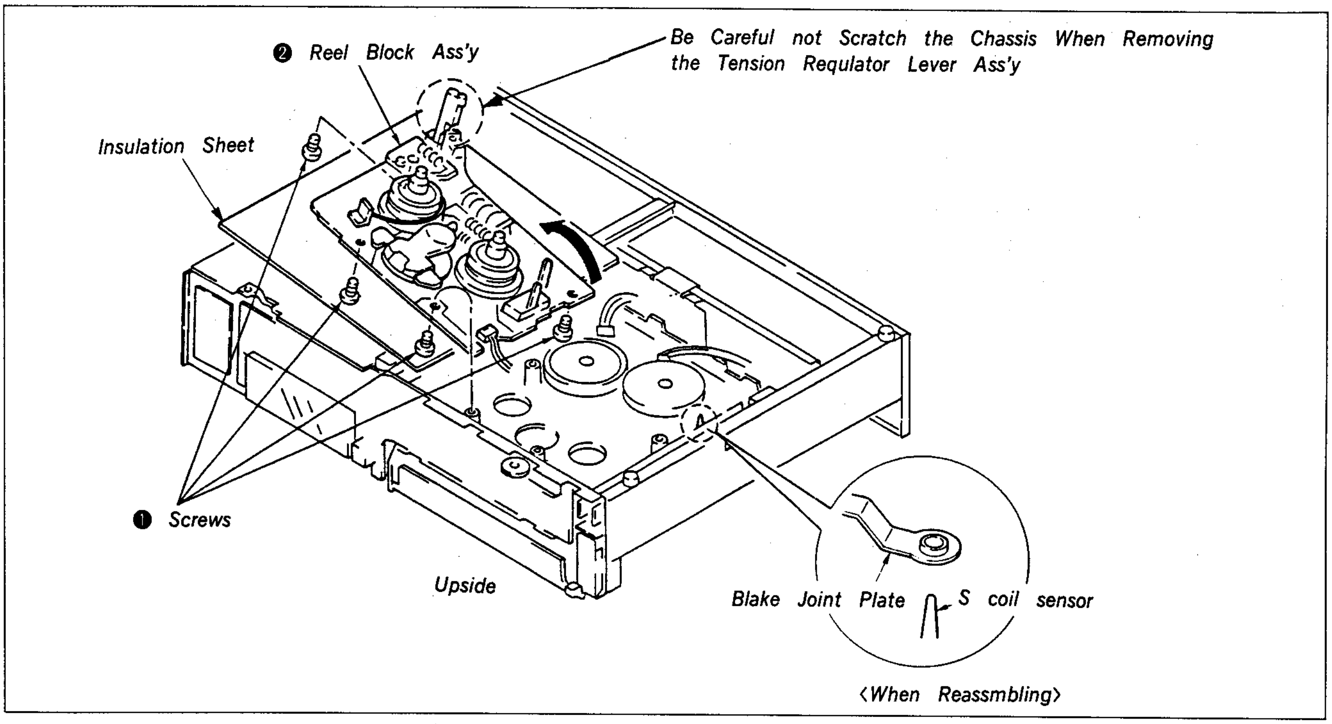
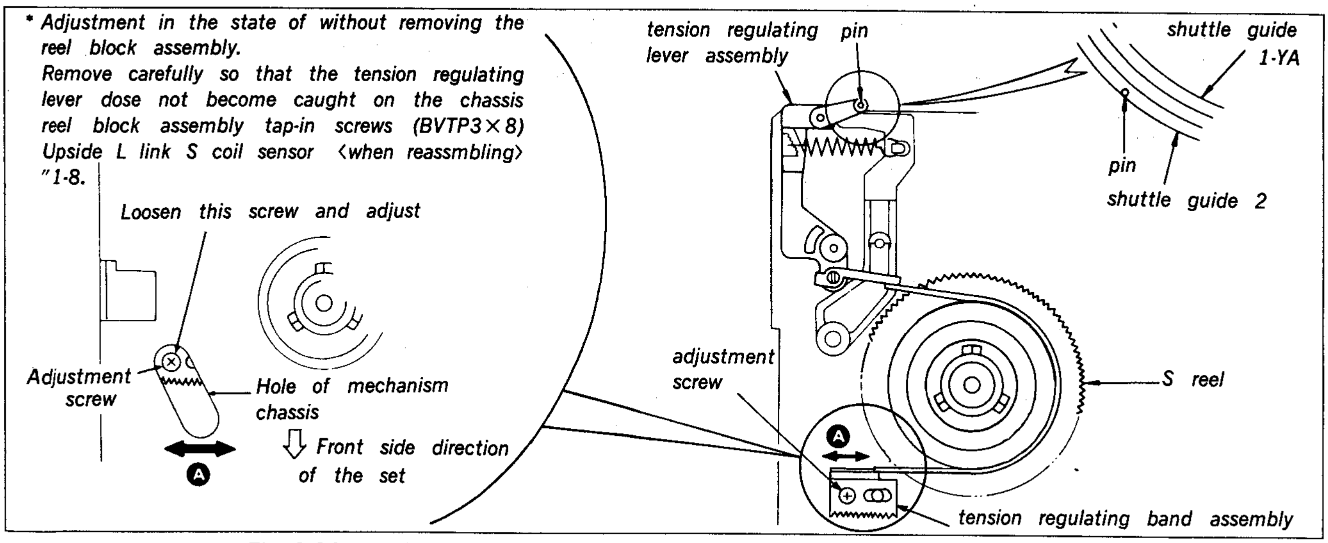

❷ Reel Block Ass'y
Be Careful not Scratch the Chassis When Removing the Tension Requlator Lever Ass'y
Insulation Sheet
❶ Screws
Upside
Blake Joint Plate
S coil sensor
A
⟨When Reassmbling⟩

Fig. 3-29 Removal of the reel block assembly

3-12-2. Adjustment of the Position of the Tension Regulating Lever

[Method of adjustment]

1) Put the unit in playback mode.
2) Loosen the adjustment spring until the tape guide pin of the tension regulating lever assembly is positioned to the outside of the outer circumference of shuttle guide 2. as shown in Fig. 3-30. Then adjust by moving the tension regulating band assembly in the direction of arrow Ⓐ .
3) After adjustment tighten the adjustment screw, being careful that the tension regulating band assembly does not move.



** Adjustment in the state of without removing the reel block assembly.*
Remove carefully so that the tension regulating lever dose not become caught on the chassis reel block assembly tap-in screws (BVTP3×8) Upside L link S coil sensor ⟨when reassmbling⟩ "1-8.

Loosen this screw and adjust
Adjustment screw
Hole of mechanism chassis
Front side direction of the set
Ⓐ
tension regulating lever assembly
pin
shuttle guide 1-YA
pin
shuttle guide 2
adjustment screw
Ⓐ
S reel
tension regulating band assembly

Fig. 3-30. Adjustment of the position of the tension regulating lever

3-13. ADJUSTMENT OF THE FORWARD BACK TENSION

[Method of measurement]

1) Insert the torque cassette (SL-0003C) and put the unit in playback mode.
2) Read the value on the meter on the S reel side after the needle has gone around about once.
   The correct value is 34g•cm ± 3g•cm.

Notes:

i) The set must be perfectly level during this measurement.

ii) After the measurement, the tape can become slack when the stop button is pressed. If this happens set the unit is forward mode to take up the slack before removing the tape.

[Mothod of adjustment]

Move the position of the tension coil spring that is hooked on the tension regulating lever assembly in the direction of arrow Ⓐ until the measured value falls within the correct range.

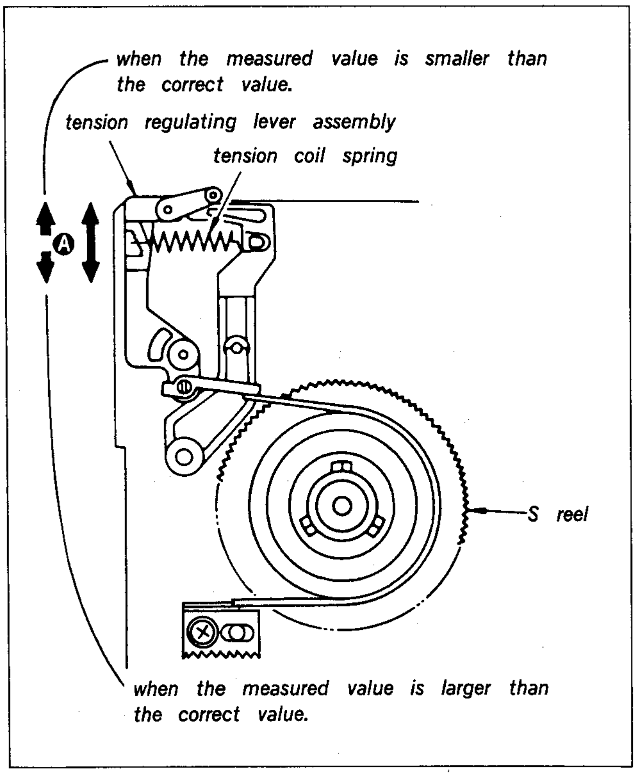

when the measured value is smaller than the correct value.
tension regulating lever assembly
tension coil spring
Ⓐ
S reel
when the measured value is larger than the correct value.

Fig. 3-31. Adjustment of the back tension

3-14. ADJUSTMENT OF THE FORWARD TORQUE

[Method of measurement]

1) Insert the torque cassette (SL-003C) and put it into video recording state.
2) Read the indicated value of the meter on the T reel side when it has become stabilized.
   The correct value is 80g•cm ± 5g•cm.

[Method of adjustment]

1) Turn RV401 on ST-12 board to adjust the torque until its value falls within the correct range.

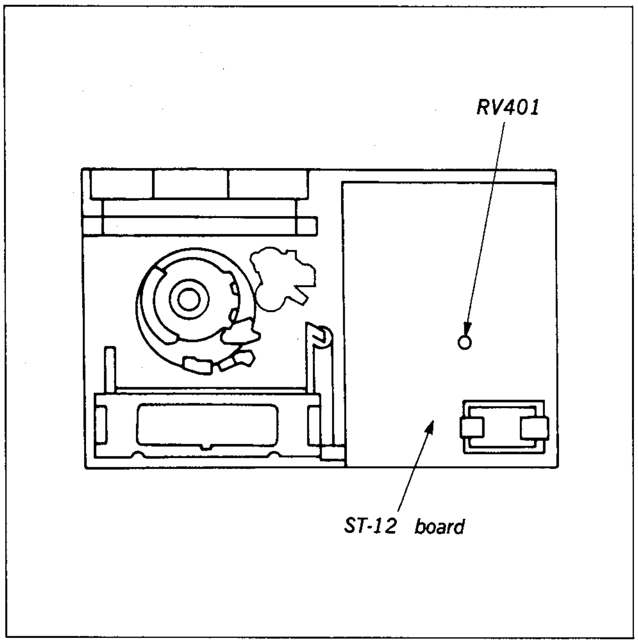

RV401
ST-12 board

Fig. 3-32. Adjustment of the forward torque

Note:

When the forward torque is weakened during the measurement the tape can become slack, in which case the set will go into emergency stop mode. In such a case, the only switches that will work are the cassette eject switch and the power switch. It is necessary to temporarily remove the cassette, or to turn the power OFF and back ON.

4. TAPE PATH ADJUSTMENT

4-1. TRACKING ADJUSTMENT

This adjustment has a large effect on the picture quality in each mode and on the interchangeabillity of tapes. so it should be done carefully.

4-1-1. Preparation for adjustment
4-1,2. Adjustment on the entrance side
4-1-3. Adjustment on the exit side

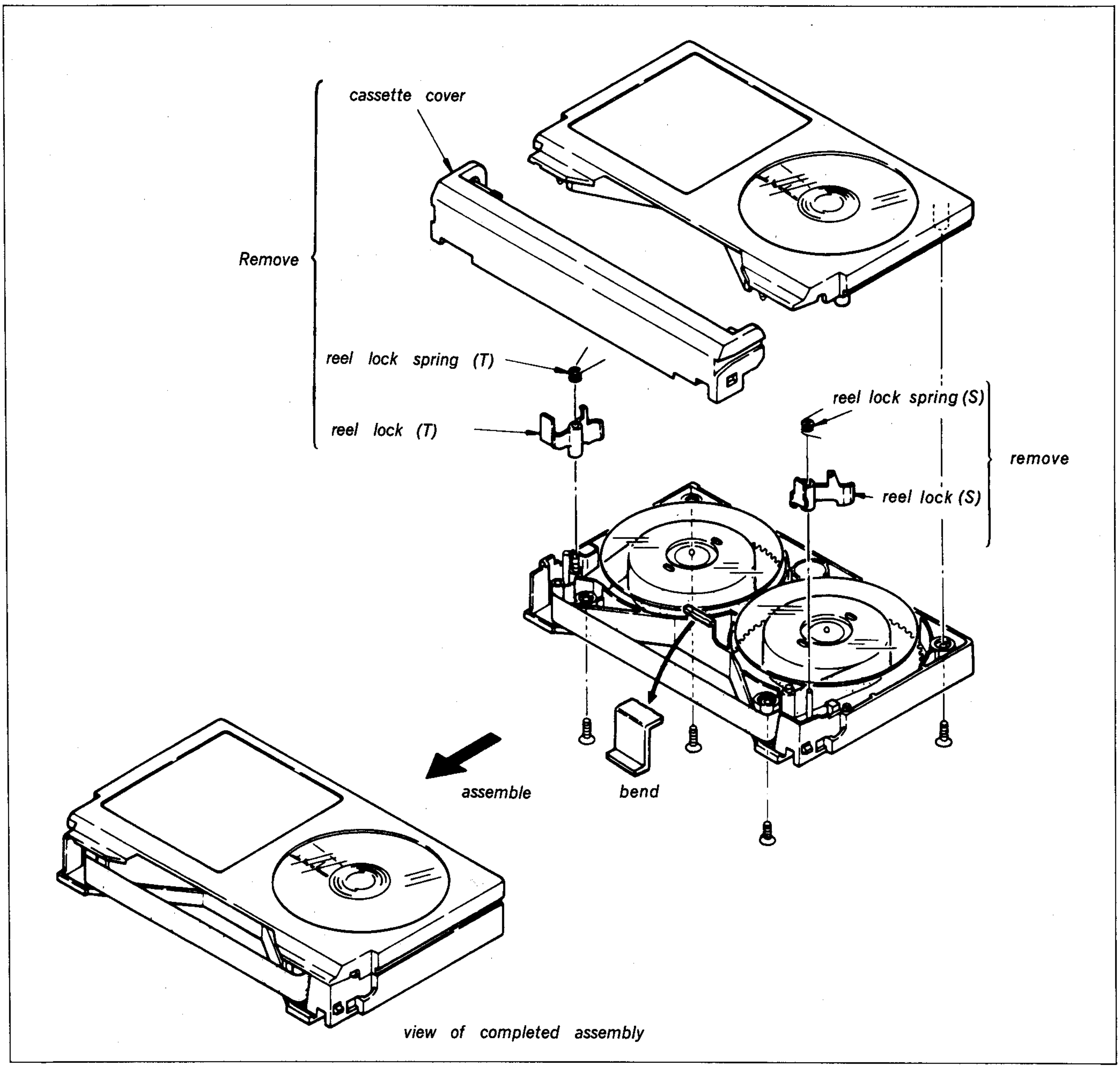
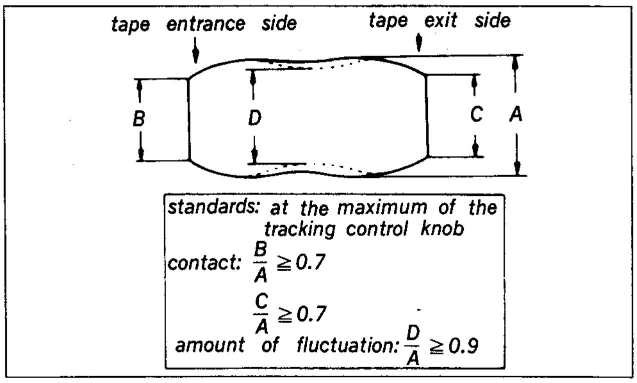

cassette cover
Remove
reel lock spring (T)
reel lock (T)
reel lock spring (S)
remove
reel lock (S)
assemble
bend
view of completed assembly

Fig. 4-1.

4-1.1. Preparation for Adjustment

1) Remove the cassette cover of the alignment tape in accordance with Fig. 4-1.
2) Clean the surface contacted by traveling tape (tape guide. drum tape trailing surface capstan shaft pich roller. ACE FE head surface) with a chamois cloth dipped in methanol.
3) Connect the oscilloscope as follows:
   Channel 1:pin ③ of CN005 (RP-41 board)
   External trigger: pin ① of CN005 (RP-41 board)
4) Playback the 1 MHz signal on the traking section of the alignment tape. (KR2-IH)
5) Confirm that the oscilloscope radio frequency output waveform is flat and that the amplitude is a maximum. (Turn the tracking knob right and left to increase and decrease the amplitude while the waveform remains flat.) When the amplitude of the waveform is a maximum. confirm that the fluctuations and contact of the radio frequency output waveform meet the standards given in Fig. 4-2. If they do not. go through the procedure given in step6).
6) If the entrance waveform cannot be made flat. as shown in Fig. 4-3 (a). by turning the tracking knob. go through the "entrance side adjustment" described in 4-1-2: if the exit waveform shown in Fig. 4-3 (b) cannot be made flat. go through the "exit side adjustment" in 4-1-3.



standards: at the maximum of the tracking control knob

contact: $\frac{B}{A} \geqq 0.7$

$\frac{C}{A} \geqq 0.7$

amount of fluctuation: $\frac{D}{A} \geqq 0.9$

Fig. 4-2.

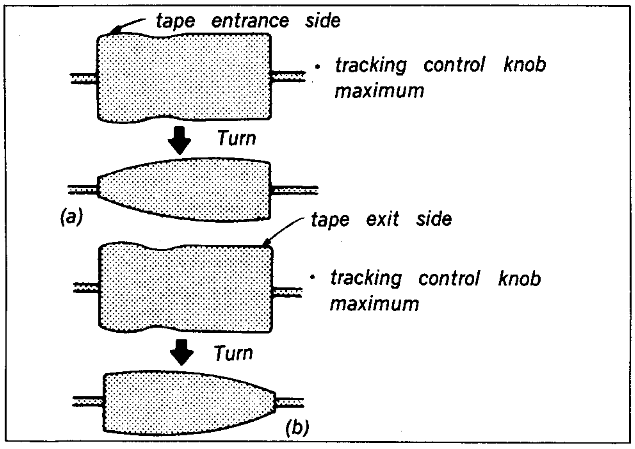

tape entrance side
• tracking control knob maximum
Turn
(a)
tape exit side
• tracking control knob maximum
Turn
(b)

Fig. 4-3.

4-1-2. Entrance Side Adjustment

Whenever the entrance side adjustment is performed. the exit side adjustment must also be performed. The various tape guides and adjustment positions are shown in Fig. 4-5.

1) Turn the No.6 guide counterclockwise to free the movement of the tape as it enters the drum.
2) Turn the tracking control knob until the amplitude of the waveform is about 60% of its maximum.
3) Loosen No.5 guide lock screw ❶ and turn the No.5 guide until the entrance waveform sticks up a little above falt. as shown in the figure below. Then tighten the No.5 guide lock screw ❶ (Fig. 4-6).

   Note:

   After tightening No.5 guide lock screw ❶, confirm that it is as in the figure below.

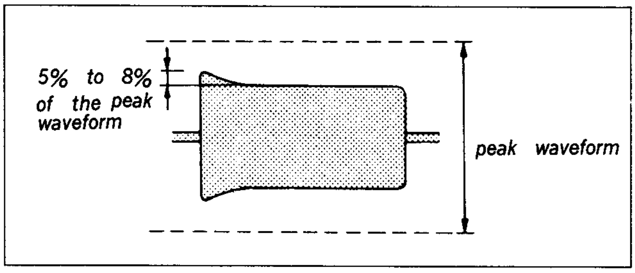


Fig. 4-4.

4) Next. lower the No.6 guide until the waveform is flat.
5) Press the tape down between the NO.4 and No.5 guide with a finger to lower the entrance side radio frequency waveform. then let go and confirm that the waveform returns to what it was before.
6) In this condition. check the clearance and curl of the No. 5 guide. If there are clearance and curl. adjust as explainedin subsequent sections.

Note:

The tape tension between the No.3, No.4 and No.5 guides must be balanced. If it is not, adjust the tilt of the No.3 and No.5 guides.

If the waveform cannot be made to look as shown in Fig. 4-4. or if when the tape is pressed and released on the entrance side it takes time for the waveform to return to what it was before. or if it does not return to what it was before. adjust according to the instructions given below.

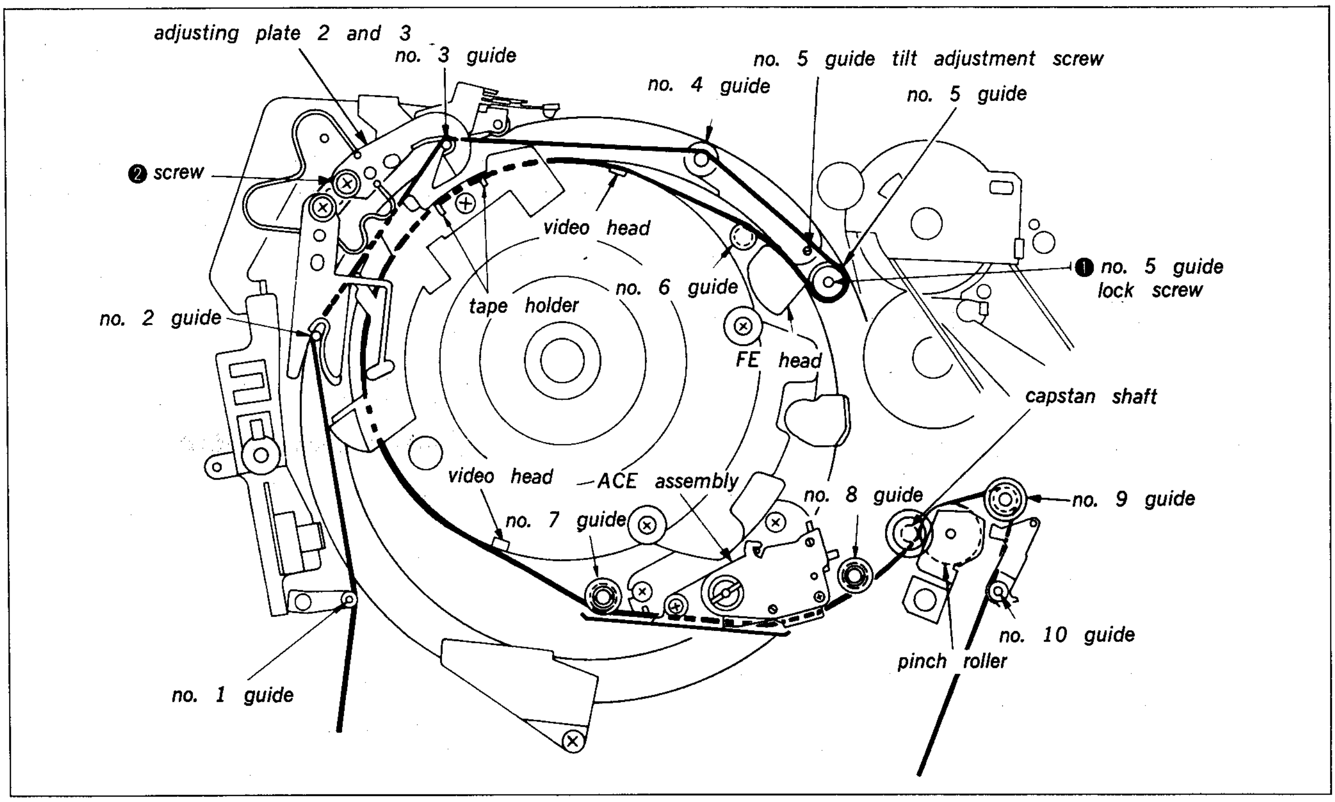

adjusting plate 2 and 3
no. 3 guide
no. 5 guide tilt adjustment screw
no. 4 guide
no. 5 guide
❷ screw
video head
no. 6 guide
❶ no. 5 guide lock screw
tape holder
no. 2 guide
FE head
capstan shaft
video head
ACE assembly
no. 8 guide
no. 9 guide
no. 7 guide
no. 10 guide
pinch roller
no. 1 guide

Fig. 4-5. Tape guide layout diagram

[What to do when the waveform entrance output will not rise]

1) Check to see if the up-down tension between the No. 3. No.4 and No.5 guides is uniform. If it is not, adjust the tilt of the No.3 and No.5 guides.

   Note:

   The lower flange of the No.4 guide must not protrude.

2) Raise the lower flange of the No.4 guide to raise the entrance output.

   Note:

   It is sufficient to raise the lower flange of the No. 4 guide to 0.4mm from its lowest position (within a rotation angle of 360°).

3) If the operation performed in step 2) fails to raise the waveform output, turn the No.5 guide tilt adjustment screw slightly to the left, and the entrance output should rise.

[What to do when the waveform entrance output will not drop]

1) Remove the adjusting plate 2 and 3 of the No.3 guide from the drum. Just before the lower tension of the tape becomes slack, tighten screw ❷.
2) If the tape is in contact with the lower flange of the No.4 guide. lower the flange. If the tape is sitcking up from the lower flange. adjust the tilt of the No.5 guide so that the tape does not stick up from the lower flange of the No.4 guide.

[What to do when there is a clearance in the No.5 guide]

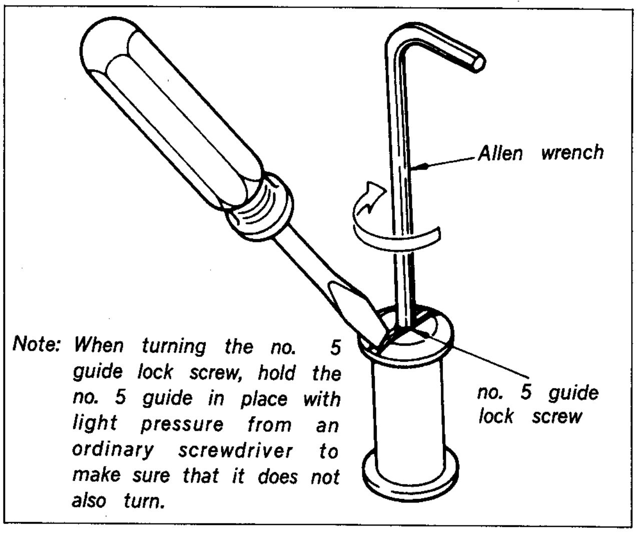
Turn the No.4 guide counterclockwise to run the tape upward and eliminate the clearance in the No.5 guide.

Note:

At this time make sure that a large curl is not produced below the No.4 guide.

[What to do when there is a curl]

1) When there is a gap below the No.4 guide. Just before the lower tension on the tape becomes slack, move adjusting plate 2 and 3 of the No.3 guide to the outside.
2) When there is not a gap below the No.4 guide (when there is a curl below the No.4 guide):
   i) Check to see if the No.4 guide has been raised up too high. If it has been raised up too high. turn the adjusting plate clockwise to lower the No.4 guide.
   ii) If the curl still has not been removed after i). tighten the No.5 guide tilt adjustment screw in the clockwise direction until the curl is removed.


Allen wrench
no. 5 guide lock screw

Note: When turning the no. 5 guide lock screw, hold the no. 5 guide in place with light pressure from an ordinary screwdriver to make sure that it does not also turn.

Fig. 4-6.

4-1-3. Exit Side Adjustment

1) Connect the oscilloscope to pin③ of CN005 (RP-41 board).
   Connect the external trigger to pin① of CN005. (RP-41 board).
2) Play the tracking section of the alignment tape. Adjust the tracking knob to reduce the amplitude of the radio frequency output waveform to 60% of its maximum level.
3) Watch the radio frequency output waveform when the No.7 and No.8 guides are raised (by turning the respective guide nuts counterclockwise) to let tape run free. This waveform is called exit free waveform.

Note:
Be careful not to raise the guides too far. They should be raised only about 0.2 to 0.3 mm.

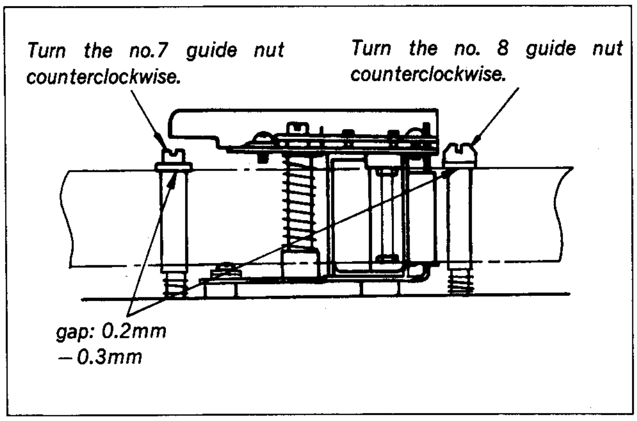
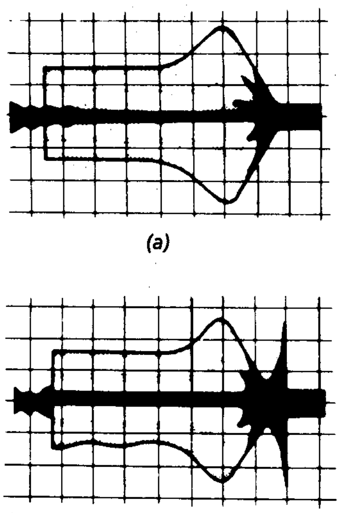

Turn the no.7 guide nut counterclockwise.
Turn the no. 8 guide nut counterclockwise.
gap: 0.2mm
– 0.3mm

Fig. 4-7.

4) At this time. confirm that the exit free waveform is within the range shown in Fig. 4-8 (a) and (b).
   - If it is outside of this range. adjust according to the procedure in 4-3.



(a)

(b)

Fig. 4-8.

5) Turn the No.7 guide nut clockwise until the waveform is flat.
6) Turn the No.8 guide nut clockwise until the No.8 guide is lined up with the tape (just before the waveform starts to change, lower the guide until there is no curl).
7) During playback. confirm that no curl occurs at the No.7 guide or the No.8 guide.
8) During rewind. confirm that no curl or elearance occurs at the No.8 guide. If there is a curl or clearance. adjust using the No.9 guide. After adjustment. lock the guide nut.

4-2. ADJUSTMENTS AFTER REPLACEMENT OF THE ACE ASSEMBLY

After removal or replacement of the ACE assembly perform the adjustments listed below.

4-2-1. Exit side tracking adjustment
4-2-2. CTL head (ACE assembly) position adjustment
4-2-3. Audio head (ACE assembly) azimuth adjustment
4-2-4. Audio head (ACE assembly) height adjustment

4-2-1. Exit Side Tracking Adjustment

1) Set the parallel plate (SL-0657 in the list of fixtures and tools) up against the unit as shown in Fig. 4-9. and turn the tilt adjustment screw to adjust the audio head vertically.

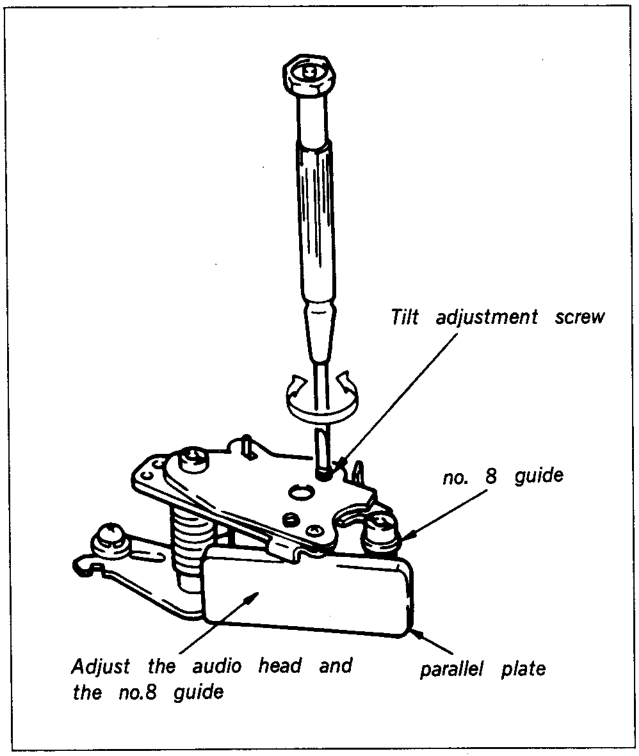

Tilt adjustment screw
no. 8 guide
Adjust the audio head and the no.8 guide
parallel plate

Fig. 4-9.

2) Connect the oscilloscope to pin ③ of connector CN005 (RP-41 board). Connect the external trigger to pin ① of CN005. (RP-41 board).
3) Play the tracking section of the alignment tape. Adjust the tracking knob until the radio frequency output waveform amplitude is reduced to about 60% of its maximum level.
4) Raise the No.7 and No.8 guides (turn the respective guide nuts counterclockwise) and observe the radio frequency exit free waveform when the tape runs free.

   Note:
   Be careful not to raise the guide too far. Raise it about 0.2 to 0.3 mm.

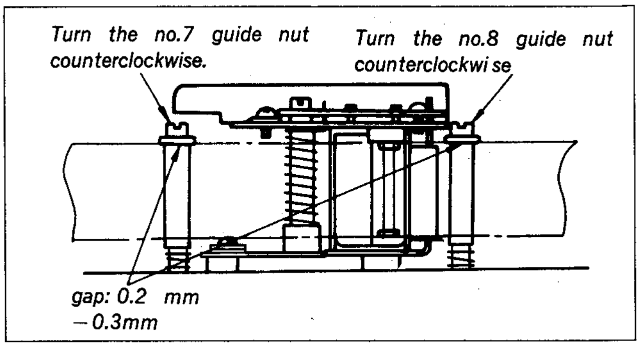
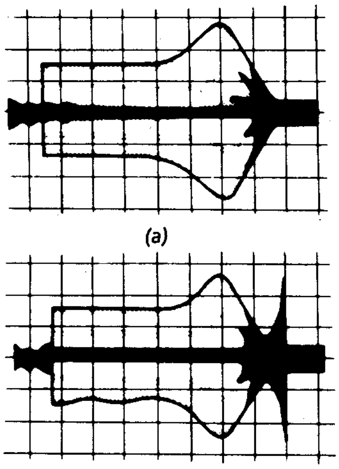

Turn the no.7 guide nut counterclockwise.
Turn the no.8 guide nut counterclockwi se
gap: 0.2 mm
– 0.3mm

Fig. 4-10.

5) At this time. confirm that the exit free waveform is within the range shown in Fig. 4-11(a) and (b).



(a)

(b)

Fig. 4-11.

[When the waveform is outside this range]

- When the waveform is outside this range and has the form shown in Fig.4-12. turn the tilt adjustment screw clokwise to adjust until the waveform is within the required range.

  Note:
  Complete the adjustment by turning the adjustment screw in the tightening direction (clockwise).

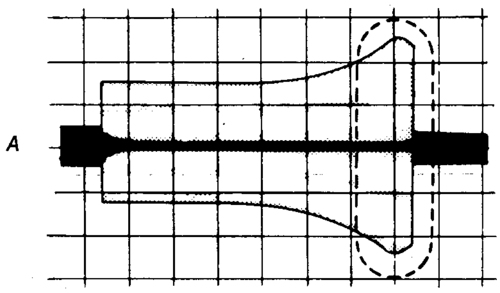


Fig. 4-12

- When the exit free waveform is outside of the required range and has the form shown in Fig. 4-13. turn the tilt adjustment screw counterclockwise to produce waveform A (Fig. 4-12). then turn it clockwise to bring the waveform within the required range.

Note:
Finish the adjustment by turning the adjustment screw in the direction of tightening (clockwise).

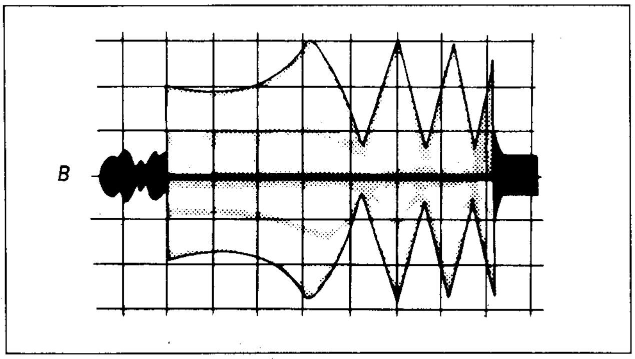


Fig. 4-13.

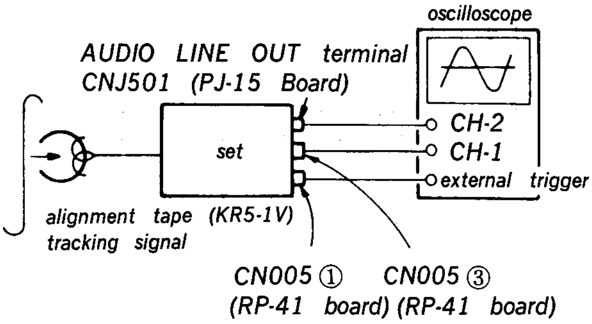
6) Turn the No. 7 guide nut clockwise to flatten the waveform.
7) Turn the No. 8 guide nut clockwise to line the No. 8 guide up with the tape (lower it so that there is no curl just before the waveform starts to change).
8) If the radio frequency waveform is as shown in Fig. 4-12 on the exit side. repeat the adjustment.

4-2-2. CTL Head (ACE Assembly) Position Adjustment

This adjustment includes the mechanical CTL head mounting position adjustment and the electrical tracking control center adjustment. The tracking control center adjustment is to be performed first. followed by the mechanical adjustment of the head mounting position.

[Connections]

1) Playback mode


oscilloscope
AUDIO LINE OUT terminal
CNJ501 (PJ-15 Board)
set
CH-2
CH-1
external trigger
alignment tape (KR5-1V)
tracking signal
CN005 ①
(RP-41 board)
CN005 ③
(RP-41 board)

[Method of adjustment]

1) Play the tracking signal section of the alignment tape.
2) Turn the tracking control knob clockwise or counterclockwise to the center click position. Confirm that the amplitude of the radio frequency output signal is at its maximum level. Also confirm that the audio signal 0 level position occurs at the location of the channel B waveform. If the necessary standards are not met follow the procedure in 3).

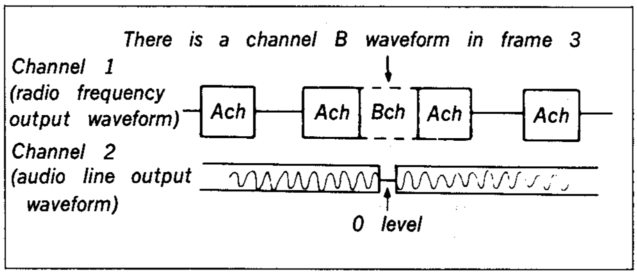

There is a channel B waveform in frame 3
Channel 1
(radio frequency output waveform)
Ach
Ach
Bch
Ach
Ach
Channel 2
(audio line output waveform)
0 level

Fig. 4-14.

3) CTL head position adjustment
   a. Set the tracking control knob at the center click position.
   b. Loosen the two ACE assembly position adjustment screws, then use a tool such as an ordinary screwdriver to slide the ACE assembly to where the radio frequency output waveform amplitude becomes a maximum.
   c. Play the color bar signal on the alignment tape and check the picture quality.
   d. Tighten the position adjustment screws. then lock them.

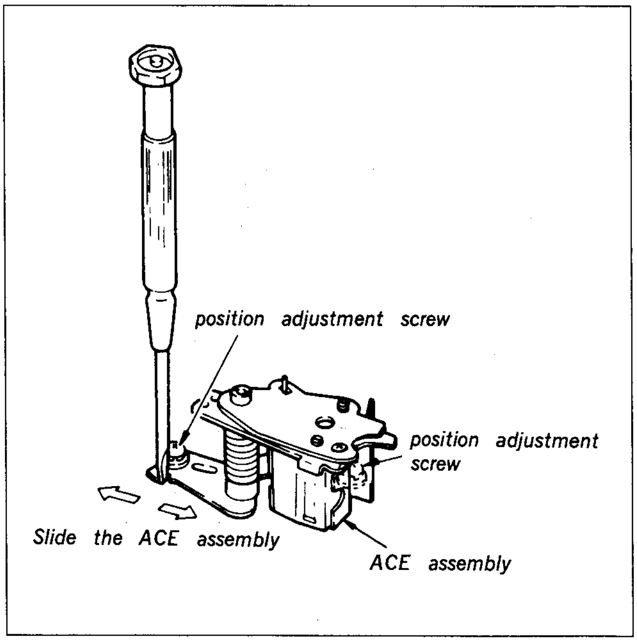
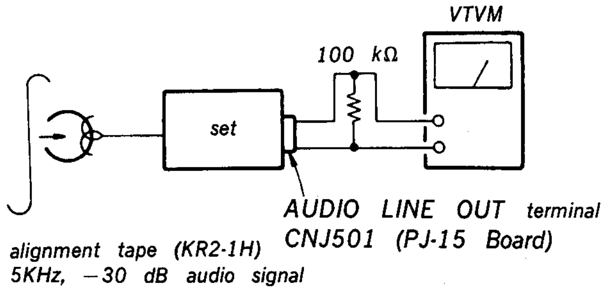

position adjustment screw
position adjustment screw
Slide the ACE assembly
ACE assembly

Fig. 4-15.

4-2-3. Audio head (ACE Assembly) Azimuth Adjustment

[**Connections**]

1) Playback mode


VTVM
100 kΩ
set
AUDIO LINE OUT terminal
CNJ501 (PJ-15 Board)
alignment tape (KR2-1H)
5KHz, −30 dB audio signal

[**Method of adjustment**]

1) Play the 5kHz, −30dB audio signal section (RF sweep section) of the alignment tape.
2) Adjust the azimuth adjustment screw until the output level (VTVM indication) is maximum.
   Note :
   Complete the adjustment by turning the adjustment screw in the tightening direction (clockwise).
3) After adjustment, lock the adjustment screw.

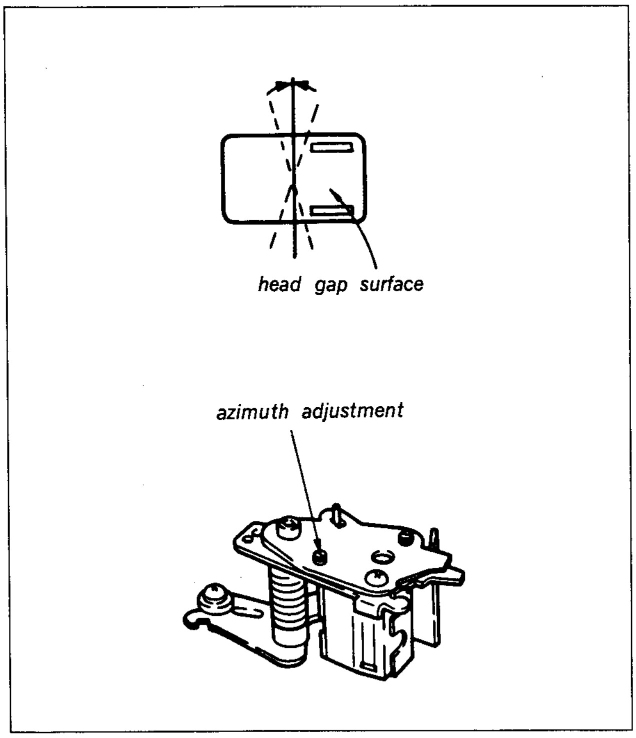

head gap surface
azimuth adjustment

Fig. 4-16.

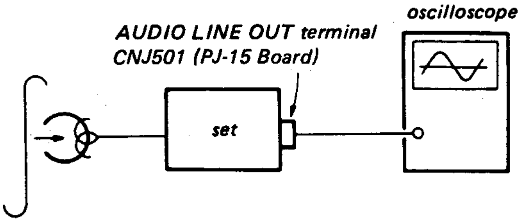
4-2-4. Audio Head (ACE Assembly) Height Adjustment

[**Condition**]

This adjustment must only be performed after the exit side tracking adjustment has been completed.

[**Connections**]

1) Playback mode


oscilloscope
AUDIO LINE OUT terminal
CNJ501 (PJ-15 Board)
set

[**Method of adjustment**]

1) Play the 5kHz, −30dB audio signal section (RF sweep section) of the alignment tape.
2) Adjust the height adjustment screw and the tilt adjustment nut so that the amplitude of the audio line output waveform (5kHz) becomes a maximum.

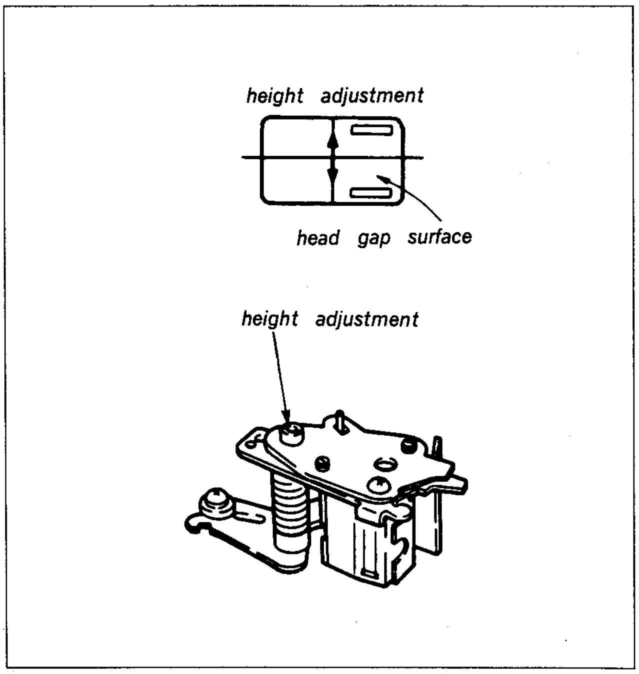

height adjustment
head gap surface
height adjustment

Fig. 4-17.

4-3. HOW TO CHECK THE TAPE TRAVELING AFTER ADJUSTMENT OF TAPE PATH

Adjust and check the tape path using the alignment tape then check the tape travel using the procedure below.

1) Prepare one L-830 reel ready (these cassette are widely available commercially). Remove the cassette cover referring to Fig. 4-1 of the adjustment guide.
2) Run the L-830 tape in playback mode and check the following points.
   i) Entrance side
      Confirm that the tape does not contact the upper flange of the No. 4 guide or the No. 6 guide. and is not damaged. (Some tape curl is allowed but the tape must not be creased.) (Fig. 4-18)
   ii) Exit side
      Confirm that the tape does not contact the upper flange of the No. 7 guide or the No. 8 guide. or the upper or lower flange of the No. 10 guide. and is not scratched. (Some tape curl is allowed but the tape must not be creased.) (Fig. 4-19)
   iii) If the tape was found to not be running correctly in step ii). readjust the tape path using the alignment tape.
      If the tape is not running correctly on the entrance side. refer to section 4-1-2.
      If the tape is not running correctly on the exit side. refer to section 4-1-3.

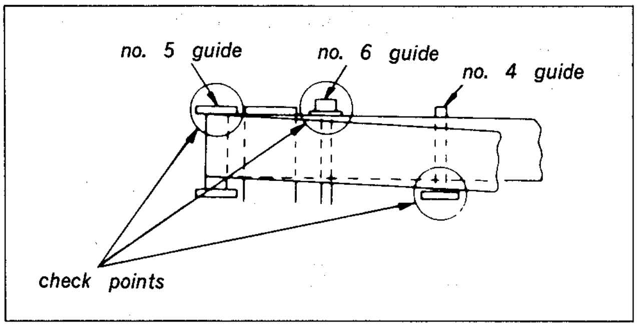


Fig. 4-18.

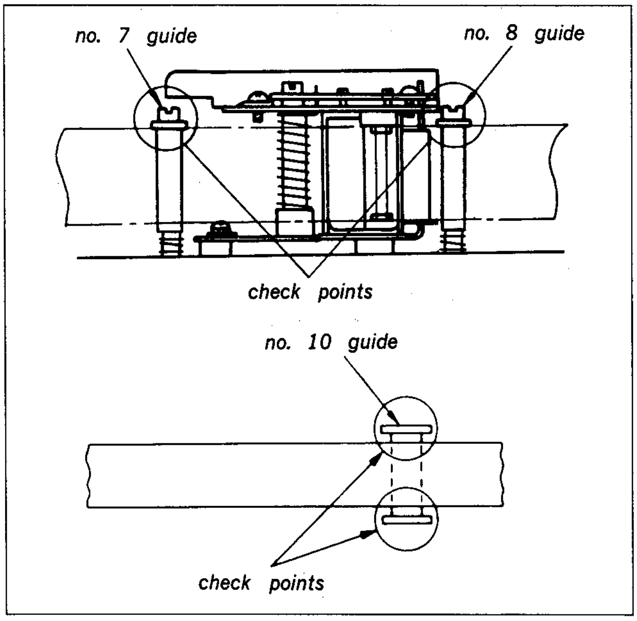


Fig. 4-19.

5. ELECTRICAL ADJUSTMENTS

During the adjustment, see the parts location diagram relevant to the adjustment on page 176, 177.

All the electrical adjustment can be performed by using the equipment mentioned below, the alignment tape, and the PAL colour-bar signal(100%).

[Equipment Required]

(1) PAL Colour Monitor TV
(2) Oscilloscope, Dual-trace, Bandwidth... more than 10 MHz with delay mode
(3) Frequency Counter
(4) PAL Colour-Bar Generator
(5) Digital voltmeter
(6) Distortion meter
(7) Audio Signal Generator
(8) Audio level meter(VTVM)
(9) Attenuator
(10) Alignment Tape, type: KR5-2H, Code No. 8-969-995-52

[Setup for Adjustment]

The antenna should be connected correctly to the antenna input terminal of the videocassette recorder. It is important that the video output signal satisfies the specification because the telecast signal received by the incorporated tuner of the videocassette recorder is utilized as the adjustment signal of the machine. The incorporated tuner should be set to the channel with the best reception. The video signal should be checked with an oscilloscope connected to VIDEO OUT terminal. Verify that the sync signal amplitude is approx. 0.3Vp-p and the video signal amplitude is approx. 0.7Vp-p at peak. Adjust the fine tuning while observing the signal and the TV screen so that the burst signal amplitude becomes approx. 0.3V ± 0.1Vp-p. Also confirm that there is not spikes observed at the sync signal portion. (See Fig. 5-1.)

The video (colour-bar) signal for the adjustment is shown in Fig. 5-1.

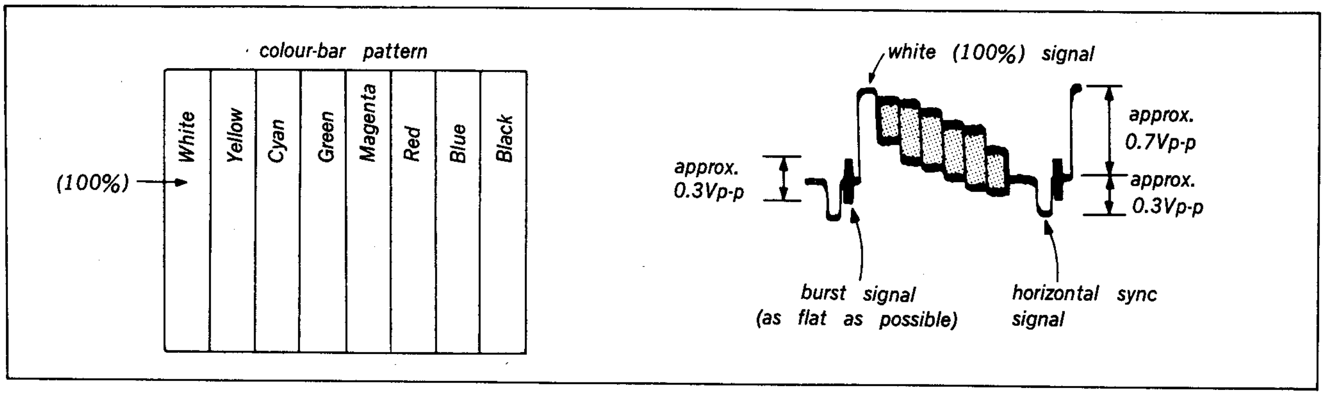


Fig. 5-1. Video (colour-bar) signal

[Alignment Tape]
KR5-2H

	Video signal	Audio signal	Playing time	Use for
1.	Colour-bars	3kHz −5dB	5 min	General performance, tape speed checks, switching position adjustment.
2.	Monoscope	333Hz −25dB	5 min	Video head dihedral, audio level adjustment.
3.	RF sweep	5kHz −25dB	5 min	Video audio frequency characteristics, audio azimuth adjustment. marker: 1, 2, 3.58, 4.5, 5.2, MHz
4.	Tracking 1 MHz(CH-B) *1(Channel B is inserted in every 3 frames.)	1 kHz −5dB *2(Signal is dropped out in the positions where channel B is inserted.)	5 min	Tracking, Audio height adjustments CTL Position check. (Check if *1 and *2 are the same position.)

[Required Levels and Impedances of Input and Output]

Video

Input VIDEO IN: Phono jack
1.0V(p-p)$^{+1.0}_{-0.5}$ V(p-p)
75 ohms, unbalanced,
sync negative

Output VIDEO OUT : Phono jack
1.0V(p-p)±0.1V(p-p)
75 ohms, unbalanced,
sync negative

Audio

Inputs AUDIO IN: Phono jacks
47 kilohms, −10dBs
(0dBs = 0.775Vrms)
Microphone: −60dBs, for low-impedance microphone

Outputs AUDIO OUT: Phono jacks
Load impedance less than 10 kilohms
−10dBs with 47 kilohms load,
unbalanced

[Colour-Bar Signal]

The 100% colour-bar signal recorded on the Alignment tape is shown in Fig. 5-2.

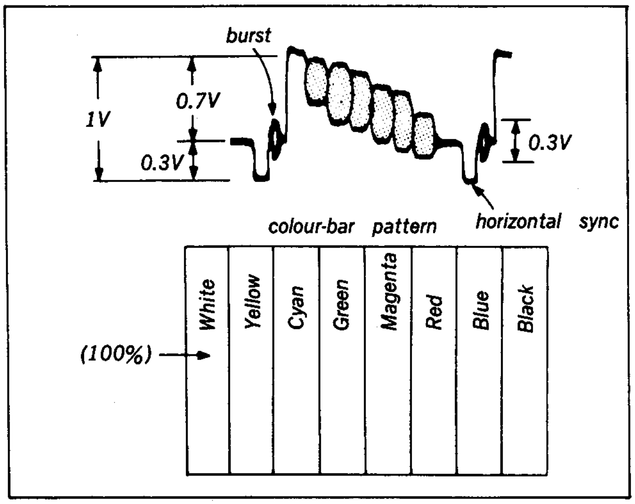
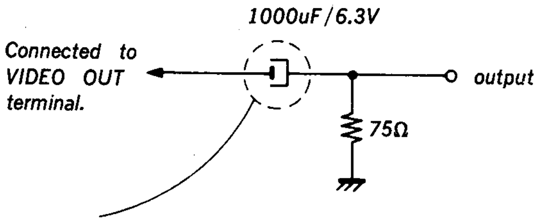

burst
1V
0.7V
0.3V
0.3V
colour-bar pattern
horizontal sync
White
Yellow
Cyan
Green
Magenta
Red
Blue
Black
(100%)

Fig. 5-2. Colour-bar signal recorded on the alignment tape

[75Ω Terminating Method]

To terminate the video output terminal follow the steps shown in Fig. 5-3.

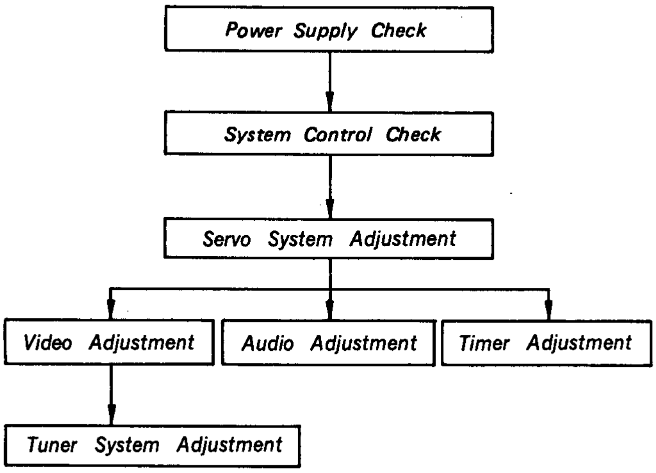

1000uF/6.3V
Connected to VIDEO OUT terminal.
output
75Ω

Note : The machine may be damaged if it is terminated in 75Ω before cutting the DC component.

Fig. 5-3. 75Ωterminating circuit

[Adjustment Procedure]

Adjust in the order given below.


Power Supply Check
System Control Check
Servo System Adjustment
Video Adjustment
Audio Adjustment
Timer Adjustment
Tuner System Adjustment

5-1. POWER SUPPLY CHECK (PS-115 Board)

Measure in E-E mode (POWER supply switch ON)

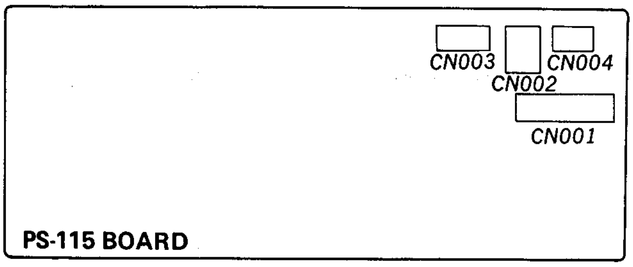


Fig. 5-4. Component layout

1. Switched 12V check
   Pin ② of CN002 shall be 12.0±0.3Vdc
2. Switched 9V check
   Pin ② of CN001 shall be 9.0±0.1Vdc
3. Un switched + 5.5V check
   Pin ④ of CN003 shall be 5.5±0.1Vdc
4. AC 45V check
   Between Pin ⑥ (45Vac) and Pin ⑤ (GND) of CN003 shall be approx. 38Vac

5-2. SYSTEM CONTROL CHECK (ST-12 Board)

5-2-1. Clock Frequency Check

Mode	E-E
Signal	None
Measurement Point	Pin (59) of IC401
Measurement Equipment	Frequency counter
Specified Value	6.0±0.1MHz

[Confimation Method]

(1) Confirm by a frequency counter that the frequency of Pin (59) of IC 401 is 6.0±0.1MHz.

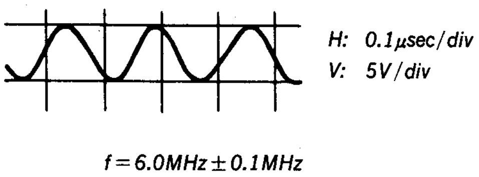


Fig. 5-5. Clock frequency

5-3. SERVO SYSTEM ADJUSTMENT

[Adjustment Sequency]

5-3-1. Reel motor control system Adjustment
5-3-2. Drum/Capstan servo system Adjustment

5-3-1. Reel Motor Control System Adjustment

1. FWD Torque Adjustment (ST-12 Board)

See "Mechanical Adjustment"

5-3-2. Drum/Capstan Servo System Adjustment

1. Voltage Check (ST-12 Board)

Measurement Point	Pin ⑪ of IC001
Measurement Equipment	Digital voltmeter
Specified Value	5.00±0.12Vdc

[Confimation Method]

(1) Pin ⑪ of IC001 shall be 5.00±0.12V

2. Clock Check (ST-12 Board)

Measurement Point	Pin ㉙ of IC001 (4.43MHz)
Measurement Equipment	Oscilloscope
Specified Value	Approx. 0.6Vp-p

[Confimation Method]

(1) Pin ㉙ of IC001 shall be approx. 0.6Vp-p

3. Drum Free Speed Adjustment (ST-12 Board)

Mode	Playback or Record
Signal	Colour bar or monoscope
Measurement Point	Pin ㊻ of IC001 (TP005)
Measurement Equipment	Digital Voltmeter
Adjustment Element	RV001
Specified Value	1.8±0.2Vdc

[Adjustment Method]

(1) Adjust to 1.8±0.2Vdc with RV001

4. Capstan Free Speed Adjustment (ST-12 Board)

Mode	Record
Signal	Colour bar
Measurement Point	Pin ⑦ of IC001 (TP008)
Measurement Equipment	Digital voltmeter
Adjustment Element	RV006
Specified Value	1.6±0.1Vdc

[Adjustment Method]

(1) Adjust to 1.6±0.1Vdc with RV006

5. RF Switching Position Adjustment (ST-12 Board)

Mode	Playback
Signal	Alignment tape colour bar
Measurement Point	CH1: Pin ㉞ of IC001 (TP003) CH2: Pin ③ of CN025
Measurement Equipment	Oscilloscope
Adjustment Element	(1) RV004 (2) RV003
Specified Value	(1) 7H±0.5 (448±30μsec) (2) 7H±0.5 (448±30μsec)

[Adjustment Method]

(1) Press the TRACKING button and set for the Optimum state.

(2) Adjustment RV004 so that the Lock Phase of RF SW PULSE (Ach) becomes specified value.

(3) Adjust RV003 so that the Lock Phase of RF SW PULSE (Bch) becomes specified value.

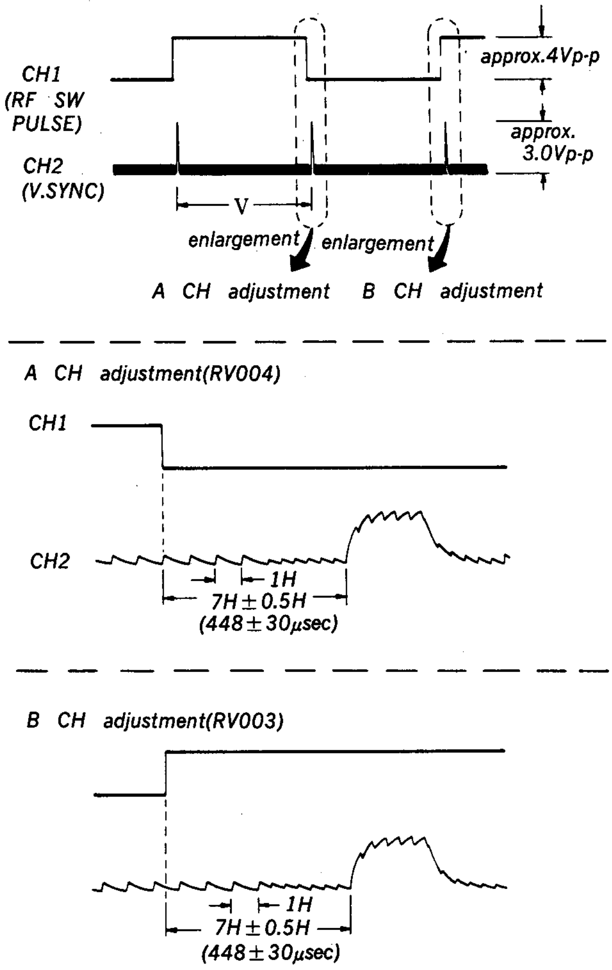

CH1
(RF SW
PULSE)
CH2
(V.SYNC)
approx.4Vp-p
approx.
3.0Vp-p
V
enlargement
enlargement
A CH adjustment
B CH adjustment
A CH adjustment(RV004)
CH1
CH2
1H
7H±0.5H
(448±30μsec)
B CH adjustment(RV003)
1H
7H±0.5H
(448±30μsec)

Fig. 5-6. Switching position adjustment

6. Drum Lock Phase Adjustment (ST-12 Board)

Mode	Record
Signal	Colour bar
Measurement Point	CH1: Pin ㉞ of IC001 (TP003) CH2: Pin ③ of CN025
Measurement Equipment	Oscilloscope
Adjustment Element	RV002
Specified Value	7H±0.5H (448±30μsec)

[Adjustment Method]

(1) Adjust RV002 so that the Lock Phase of CH1 (RF SW PULSE) and CH2 (V SYNC) become specified values.

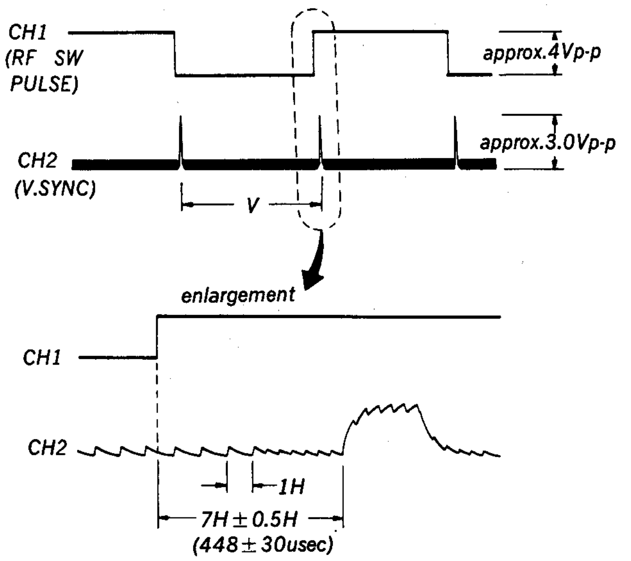


Fig. 5-7. Drum lock phase

7. Drum f_H Adjustment (ST-12 Board, VI-23 Board)

Mode	STILL (playback+pause)
Signal	Alignment tape colour bar or monoscope
Measurement Point	Pin ⑩ of IC008 on the VI-23 board (COMP SYNC)
Measurement Equipment	Oscilloscope
Adjustment Element	RV007 (ST-12 board)
Specified Value	0±0.05μsec

[Adjustment Method]

Adjust f_H during the STILL mode by RV007 (ST-12 board) to be equal to f_H in the PB mode.

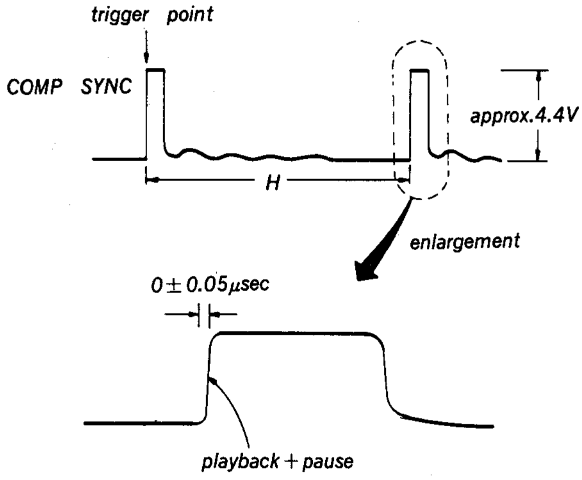


Fig. 5-8. Drum f_H adjustment

5-4. PAL VIDEO SYSTEM ADJUSTMENT

As a rule, first the playback system is adjusted with an alignment tape to check that it operates normally, then the recording system is adjusted.

The adjustment sequence is shown below. The Y signal and chroma signal systems are adjusted for both playback and recording systems.

Colour video signal supplied by the PAL colour-bar generator is used as video input signal for video system adjustment in the record mode. Check that the sync and colour burst signals conform to the specifications designated in "Set-up for Adjustment" in Fig. 5-1.

[Record System Adjustment]

1) AGC adjustment
2) Carrier set adjustment
3) Deviation adjustment
4) Compress adjustment
5) Peak clip adjustment
6) Carrier shift adjustment
7) White clip adjustment
8) Dark clip adjustment
9) Y record current adjustment
10) 4.43MHz REF adjustment
11) AFC adjustment
12) AFC offset adjustment
13) Pilot burst signal level adjustment
14) Chroma record current adjustment (I)
15) Peak ACC adjustment
16) Chroma record current adjustment (II)

[Playback System Adjustment]

1) Playback frequency characteristic adjustment
2) Expand adjustment
3) Playback video level adjustment
4) Y-comb adjustment
5) Dropout compensator adjustment
6) Carrier balance adjustment
7) Chroma comb filter adjustment
8) JOG PLL adjustment
9) JOG exchange chroma level adjustment
10) Shift adjustment

5-4-1. Record System Adjustment

1. AGC Adjustment (VI-23 Board)

Mode	E-E
Signal	Gray scale
Measurement Point	Video out terminal
Measurement Equipment	Oscilloscope
Adjustment Element	RV018
Specified Value	1.00±0.05Vp-p

[Adjustment Method]

(1) Adjust to 1.00±0.05Vp-p with RV018

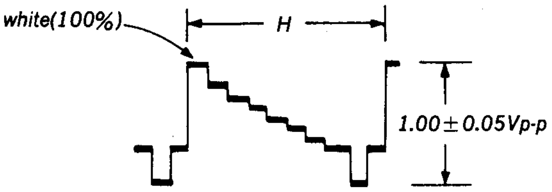


Fig. 5-9. Peak AGC Adjustment

2. Carrier Set Adjustment (VI-23 Board)

Mode	E-E
Signal	None
Measurement Point	Pin ㉕ of IC008
Measurement Equipment	Oscilloscope
Adjustment Element	RV011
Specified Value	3.800±0.038MHz

[Adjustment Method]

(1) Rotate RV010 clockwise full and rotate RV009 counter clockwise full seen from the Pattern side.

(2) Set up the input select to LINE and NORMAL mode.

(3) Adjust to 3.800±0.038MHz with RV011.

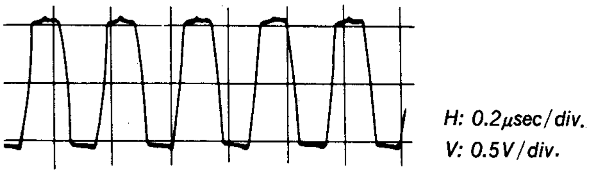


Fig. 5-10. Carrier set adjustment

3. Deviation Adjustment (VI-23 Board)

Mode	Self-record and playback
Signal	Colour bar
Measurement Point	Video out terminal
Measurement Equipment	Oscilloscope
Adjustment Element	RV013
Specified Value	1.00±0.05Vp-p

- The playback system adjustment and the carrier set adjustment in paragraph 2 above must be completed before making this adjustment

[Adjustment Method]

(1) Supply the colour-bar signal and set up E-E mode.

(2) Connect the oscilloscope to VIDEO OUT terminal.

(3) Set up record mode.

(4) Playback the recorded section of the tape.

(5) Check that the video signal level is 1.00±0.05 Vp-p, if the level is outside of this range, repeat steps(3) through(4) above adjusting with RV013 until the standard value is obtained.

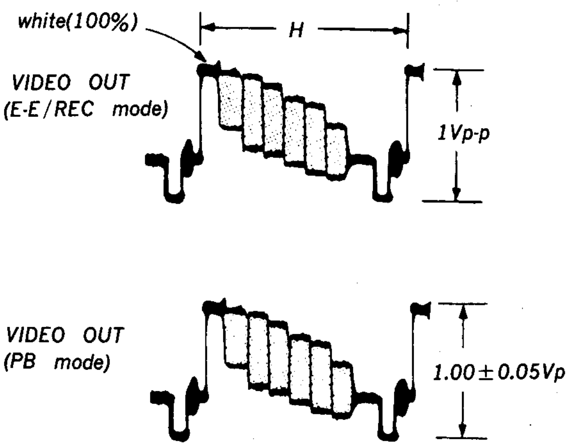


Fig. 5-11. Deviation adjustment

Note: Make sure to adjust 7 WHITE CLIP adjustment and 8 DARK CLIP adjustment

4. Compress Adjustment (VI-23 Board)

Mode	E-E
Signal	None
Measurement Point	See Fig. 5-12
Measurement Equipment	Digital voltmeter
Adjustment Element	RV014
Specified Value	0.30±0.01Vdc

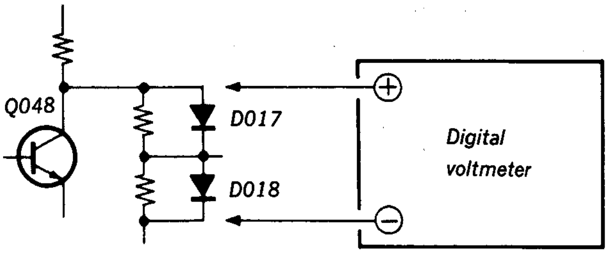


Fig. 5-12.

[Adjustment Method]

(1) Adjust to 0.30±0.01 Vdc using RV014

Note: Make this adjustment more than 30sec after turning on the power switch

5. Peak Clip adjustment (VI-23 Board)

Mode	E-E
Signal	White (100%)
Measurement Point	Base of Q052
Measurement Equipment	Oscilloscope
Adjustment Element	RV019
Specified Value	0.15±0.05Vdc

[Adjustment method]

(1) In the Q053 base, the DC level of 100% white is con-sidered as Vp. Adjust the Q052 base DC level by RV019 so that it is equal to Vp+0.15±0.05 Vdc.(See Fig. 5-13)

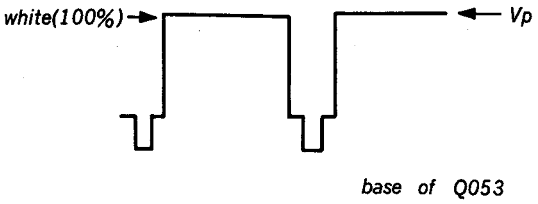


Fig. 5-13. Peak clip adjustment

6. Carrier Shift Adjustment (VI-23 Board)

Mode	E-E
Signal	None
Measurement Point	Pin ㉕ of IC008
Measurement Equipment	Oscilloscope
Adjustment Element	RV012
Specified Value	4.30±0.04MHz

[Adjustment Method]

(1) Set up the input select to LINE and Super Beta PRO mode

(2) Adjust to 4.30±0.04MHz with RV012

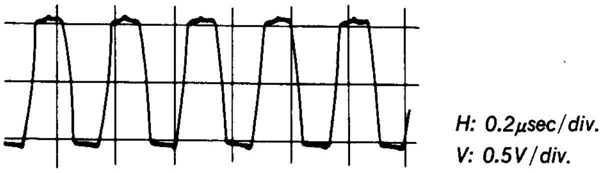


Fig. 5-14. Carrier shift adjustment

7. White Clip Adjustment (VI-23 Board)

Mode	E-E
Signal	Colour bar
Measurement Point	Collector of Q047
Measurement Equipment	Oscilloscope
Adjustment Element	RV010
Specified Value	220^{+0}_{-10} %

[Adjustment Method]

(1) Set up the Super Beta PRO mode and adjust to white peak 220^{+0}_{-10} % with RV010 (See Fig. 5-15)

8. Dark Clip Adjustment (VI-23 Board)

Mode	E-E
Signal	Colour bar
Measurement Point	Collector of Q047
Measurement Equipment	Oscilloscope
Adjustment Element	RV009
Specified Value	110±10%

[Adjustment Method]

(1) Set up the Super Beta PRO mode and adjust to Sync peak 110±10% with RV009 (See Fig. 5-15)

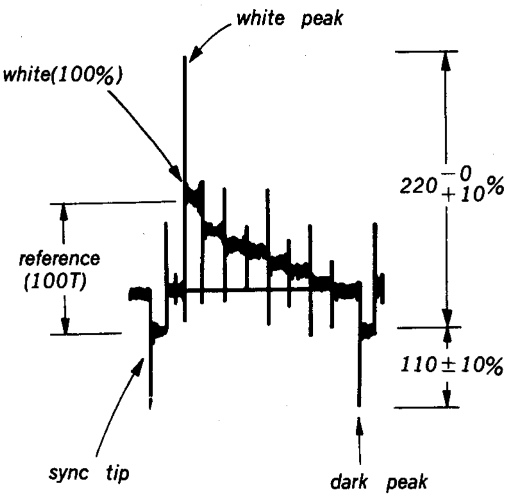


Fig. 5-15. Dark clip and white clip adjustment

9. Y Record Current Adjustment (RP-41 Board)

Mode	Record (STD mode)
Signal	None
Measurement Point	Pin ③ of CN003
Measurement Equipment	Oscilloscope
Adjustment Element	RV004
Specified Value	4.2±0.1Vp-p

[Adjustment Method]

(1) Adjust to 4.2±0.1Vp-p with RV004

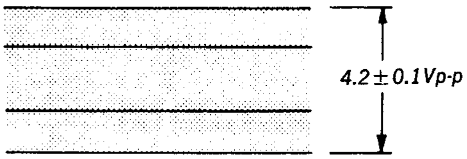


Fig. 5-16. Y record current adjustment

10. APC Adjustment (VI-23 Board)

Mode	Playback
Signal	Colour bar
Measurement Point	Pin ① of CN001
Measurement Equipment	Frequency counter
Adjustment Element	CV001
Specified Value	4433619±5Hz

[Adjustment Method]

(1) Adjust to 4433619±5Hz with CV001

11. AFC Adjustment (VI-23 Board)

Mode	E-E
Signal	None
Measurement Point	Pin ㉑ of IC001
Measurement Equipment	Frequency counter
Adjustment Element	RV022
Specified Value	5.515±0.200MHz

[Preparation]

- Apply 5Vdc to pin ⑤ of CN001 (Connect the pin ⑤ of CN001 and 5Vdc point with jumper leads)
- Apply 4.50±0.01Vdc to pin ㉖ of IC001 (Connect the pin ㉖ of IC001 with Stabilizer power Supply)

[Adjustment Method]

(1) Adjust to 5.515±0.20MHz with RV022

(2) Confirm item 12

12. AFC Offset Adjustment (VI-23 Board)

Mode	Record
Signal	Colour bar
Measurement Point	Pin ㉖ of IC001
Measurement Equipment	Oscilloscope
Adjustment Element	RV003
Specified Value	minimum (0±5mv)

[Adjustment Method]

(1) Adjust RV003 so that the fluctuation of DC level is minimum (See Fig. 5-17)

(2) Confirm item 11

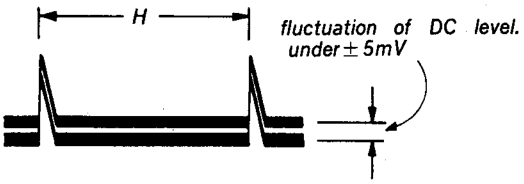


Fig. 5-17. AFC offset adjustment

Note: Repeat items 11. and 12. until each of them complies with its standard.

13. Pilot Burst Signal level Adjustment (VI-23 Board)

Mode	E-E
Signal	Colour bar
Measurement Point	Pin ① of IC001
Measurement Equipment	Oscilloscope
Adjustment Element	RV021
Specified Value	Pilot burst signal level = Chroma signal level

[Adjustment Method]

(1) Adjust the pilot burst signal with the chroma signal level using RV021

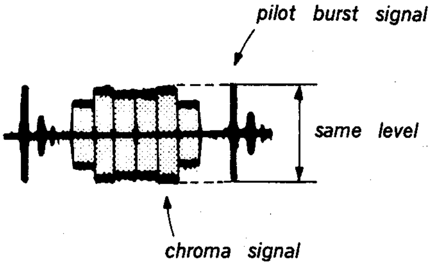


Fig. 5-18. Pilot burst signal level adjustment

14. Chroma Record Current Adjustment (I) (VI-23 Board)

Mode	Record (Super Beta PRO mode)
Signal	Colour bar
Measurement Point	Pin ③ of CN006
Measurement Equipment	Oscilloscope
Adjustment Element	RV002
Specified Value	150±5mVp-p

[Adjustment Method]

(1) Adjust to 150±5mVp-p with RV002

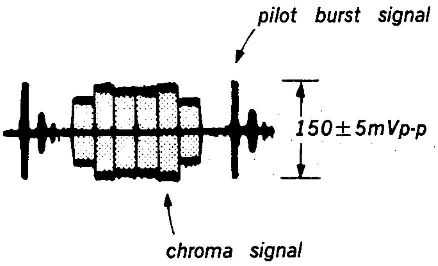


Fig. 5-19. chroma record current adjustment

15. Peak ACC Adjustment (RP-41 Board)

Mode	E-E
Signal	Colour bar
Measurement Point	Emitter of Q011
Measurement Equipment	Oscilloscope
Adjustment Element	RV006
Specified Value	2.0±0.1Vp-p

[Adjustment Method]

(1) Adjust to 2.0±0.1Vp-p with RV006

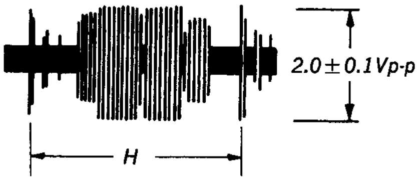


Fig. 5-20. Peak ACC adjustment

Note: Make sure to adjust 14. chroma Record Current Adjustment(I)

16. Chroma Record Current Adjustment (II) (RP-41 Board)

Mode	Record (STD mode)
Signal	Colour bar
Measurement Point	Pin ① of CN003 (Q025 collector)
Measurement Equipment	Oscilloscope (1 : 1 probe)
Adjustment Element	RV005
Specified Value	26±1mVp-p

〔Adjustment Method〕

(1) Adjust to 26±1mVp-p with RV005

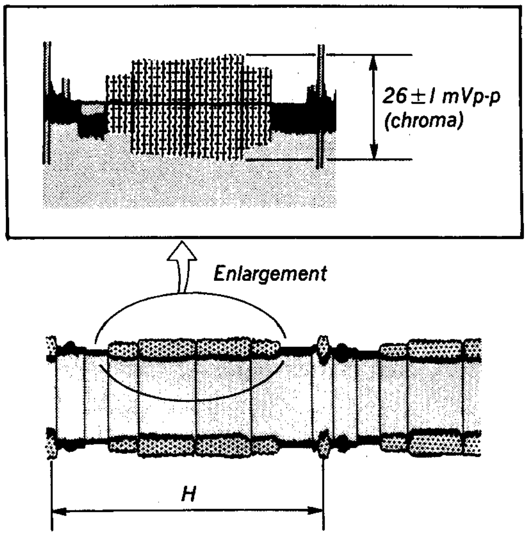


Fig. 5-21. Chroma record current

Note: Make sure to adjust 14. Chroma Record Current Adjustment(I) and 15. Peak ACC Adjustment.

5-4-2. Playback System Adjustment

1. Playback Frequency Characteristic Adjustment (RP-41 Board)

1) Adjust both the A and B channels The B channel indicated by 〔 〕

Mode	Playback
Signal	RF sweep
Measurement Point	Pin ③ of CN005 External trigger: pin ⑤ of CN005
Measurement Equipment	Oscilloscope
Adjustment Element	RV003 〔RV001〕
Specified Value	56~62% (See Fig. 5-22)

〔Adjustment Method〕

(1) Rotate the tracking knob to make 2MHz to be maximum.
(2) Rotate RV002 to adjust the 2MHz level of B-ch to be less than ±20mV to the 2MHz level of A-ch.
(3) Set the trigger slope to−〔+〕.
(4) Adjust the 5.2MHz amplitude to 56~62% of the 2MHz amplitude with RV003〔RV001〕.

2) Adjust the A' channels

Mode	Playback
Signal	RF sweep
Measurement Point	Pin ③ of CN005 Extermინal trigger: Pin ⑤ of CN005
Measurement Equipment	Oscilloscope
Adjustment Element	RV007
Specified Value	56~62% (See Fig. 5-22)

〔Prepartion〕

- (ST-12 Board) Pin ㉔ of IC001 (TP011) and Base of Q704 (TP010) with Short
  Pin (67) IC401 (TP012) with GND
- (RP-41 Board) Connect a 470Ω resister serially between Pin ① of CN001 and Stabilizer power supply (+5Vdc)

[Adjustment Method]

(1) Rotate RV008 to adjust 2MHz level of A'-ch to be less than ±20mV to the 2MHz level of A-ch

(2) Adjust the 5.2MHz amplitude to 56~62% of the 2MHz amplitude with RV007

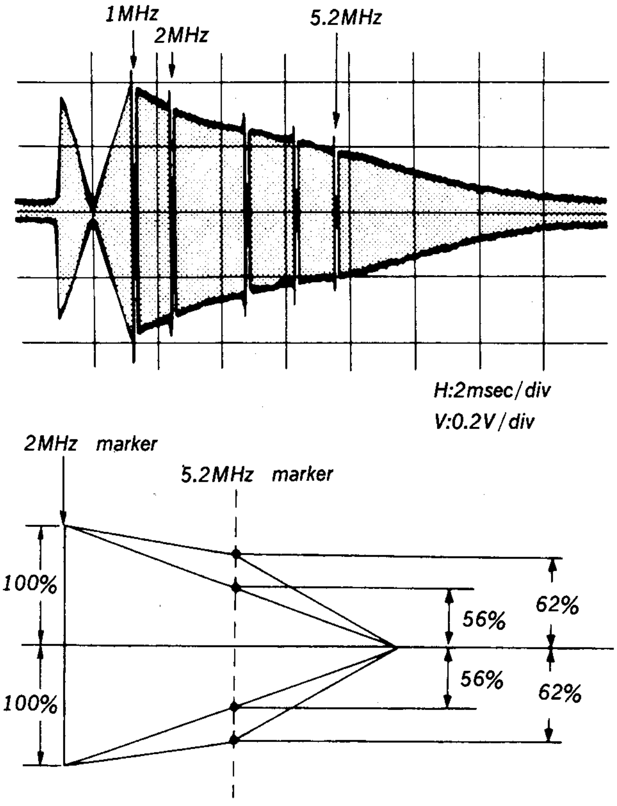


Fig. 5-22. Playback amplifier frequency character stic adjustment

2. Expand Adjustment (VI-23 Board)

Mode	Playback
Signal	Colour bar
Measurement Point	See Fig. 5-23
Measurement Equipment	Digital voltmeter
Adjustment Element	RV015
Specified Value	0.30±0.01Vdc

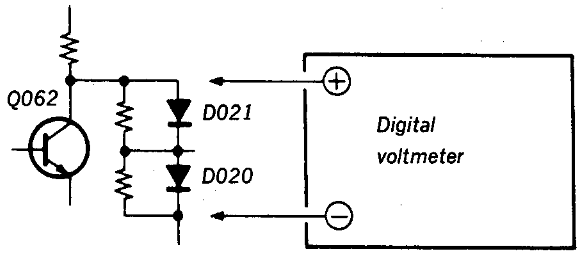


Fig. 5-23.

[Adjustment Method]

(1) Adjust to 0.30±0.01Vdc using RV015

Note: Adjust more than 30 sec after playback.

3. Playback Video Level Adjustment (VI-23 Board)

Mode	Playback
Signal	Colour bar
Measurement Point	Video out terminal
Measurement Equipment	Oscilloscope
Adjustment Element	RV016
Specified Value	1.00±0.05Vp-p

[Adjustment Method]

(1) Adjust to 1.00±0.05Vp-p with RV016

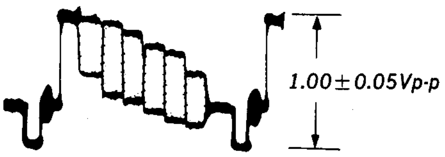


Fig. 5-24. Playback video level adjustment

4. Y-Comb Adjustment (VI-23 Board)

Mode	Playback
Signal	Colour bar
Measurement Point	Pin ⑧ of IC009
Measurement Equipment	Oscilloscope
Adjustment Element	RV017
Specified Value	See Fig. 5-25 A level ≒ B level

[Adjustment Method]

(1) Rotate RV017 to adjust to that the limiter works vertically symmetrically (See Fig. 5-25)

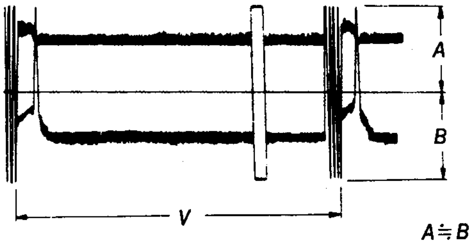


Fig. 5-25. Y-comb adjustment

5. Dropout Compensator Threshold Adjustment (VI-23 Board)

Mode	Playback
Signal	Colour bar
Measurement Point	Pin ㉖ of IC008
Measurement Equipment	Digital voltmeter
Adjustment Element	RV023
Specified Value	0.26±0.02Vdc

[Adjustment Method]

(1) Adjust to 0.26±0.02Vdc with RV023

6. Carrier Balance Adjustment (VI-23 Board)

Mode	Playback
Signal	Colour bar
Measurement Equipment	Monitor TV screen
Adjustment Element	RV004
Specified Value	Minimize beats

[Adjustment Method]

(1) Minimize beats with RV004.

7. Chroma Comb Filter Adjustment (VI-23 Board)

Mode	Playback
Signal	Colour bar
Measurement Equipment	Monitor TV Screen
Adjustment Element	RV001 and LV002
Specified	Minimize beats

[Adjustment Method]

(1) Minimize beats with RV001 and LV002

8. JOG PLL Adjustment (VI-23 Board)

Mode	E-E
Signal	Colour bar
Measurement Point	Pin ⑩ of IC006
Measurement Equipment	Oscilloscope
Adjustment Element	RV006
Specified Value	20±1μsec

[Adjustment Method]

(1) Adjust to 20±1μsec with RV006 (See Fig. 5-26)

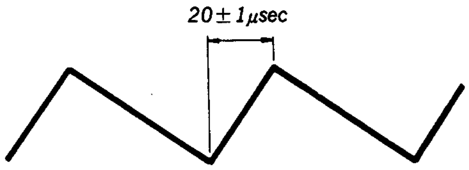


Fig. 5-26. JOG PLL adjustment

9. JOG Exchange Chroma Level Adjustment (VI-23 Board)

Mode	Playback-Pause (STILL)
Signal	Colour bar
Measurement Point	Pin ⑧ of IC006
Measurement Equipment	Oscilloscope
Adjustment Element	RV020
Specified Value	Minimum

[Adjustment Method]

(1) Adjust RV020 so that the fluctuation of level is minimum (See Fig. 5-27)

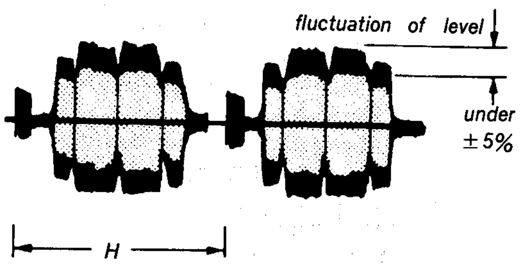

fluctuation of level
under
±5%
H

Fig. 5-27. JOG Exchange Chroma level adjustment

10. Shift Adjustment (VI-23 Board)

Mode	Playback-Pause(STILL)
Signal	Alignment tape Colour bar
Measurement Point	CH1 : Pin ㉔ of IC006 CH2 : Pin ㉓ of IC006
Measurement Equipment	Oscilloscope
Adjustment Element	RV005
Specified Value	Same level

[Adjustment Method]

(1) Adjust to the signal level (Per 1H) with RV005

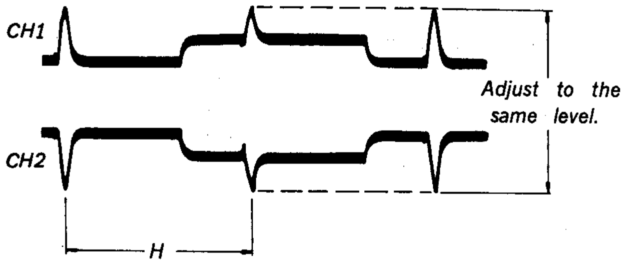

CH1
CH2
Adjust to the same level.
H

Fig. 5-28. Shift adjustment

5-5. AUDIO SYSTEM ADJUSTMENT

Adjustments of the audio system shall be mode. Use a Dynamicron tape (L125~L500) for adjustments.

[Connection of Related Equipment]

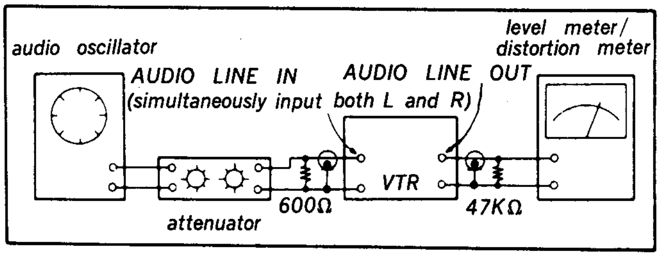

audio oscillator
level meter/ distortion meter
AUDIO LINE IN
AUDIO LINE OUT
(simultaneously input both L and R)
VTR
600Ω
47KΩ
attenuator

Fig. 5-29.

Unless otherwise specified set the VTR switch and as shown below when making the adjustments

INPUT SELECT switch···LINE

[Adjustment Sequence]

(1) ACE head adjustment
(2) Playback frequency characteristic Check
(3) Playback output level Check
(4) E-E output level check
(5) Bias oscillator Frequency and Bias Trap check
(6) Record bias adjustment
(7) Overall frequency characteristic check
(8) Overall level characteristics and distortion ratio checks
(9) Overall S/N check

1. ACE Head Adjustment

Refer to "Mechanical Adjustment"

2. Playback Frequency Characteristic Check

Mode	Playback
Signal	Alignment tape 333Hz (monoscope) and 5kHz (RF sweep) portions
Measurement Point	Audio out terminal
Measurement Equipment	Level meter
Specified Value	Within 2dB

[Confimation Method]

(1) Playback 333Hz (monoscope) and 5kHz (RF sweep) from the alignment tape and confirm so that the level difference between 333Hz and 5kHz within 2dB.

3. Playback Output Level Check

Mode	Playback
Signal	Alignment tape 333Hz (monoscope) portion
Measurement Point	Audio out terminal
Measurement Equipment	Level meter
Specified Value	−30±2dBs

[Confimation Method]

(1) Playback 333Hz (monoscope) from the alignment tape and Confimation that the output level is −30±2dBs

4. E-E Output Level Check

Mode	E-E
Signal	333Hz. −10dBs
Measurement Point	Audio out terminal
Measurement Equipment	Level meter
Specified Value	−10±2dBs

[Confimation Method]

(1) Confirm that the audio line output level is −10±2dBs

5. Bias Oscillater Frequency and Bias Trap Check (AU-26 Board)

Mode	Record
Signal	None (Input pins are short)
Bias Oscillator Frequency check	
Measurement Point	Pin ③ of CN901
Measurement Equipment	Frequency counter
Specified Value	65±6.5kHz (See Fig. 5-30)
Bias Trap Check	
Measurement Point	Pin ⑱ of IC902
Measurement Equipment	Oscilloscope
Specified Value	Bias leak is below 0.4Vp-p

- Input is "AUDIO LINE IN" input pin is shorted.

[Confimation Method]

(1) Input is Nore-signal in record mode

(2) Connect the frequency counter to pin ③ of CN901 Confirm that the oscillation frequency is 65kHz±6.5kHz (See Fig. 5-30) (Bias Oscillator Frequency)

(3) Connect the oscilloscope to Pin ⑱ of IC902 and confirm that bias leak is below 0.4Vp-p.

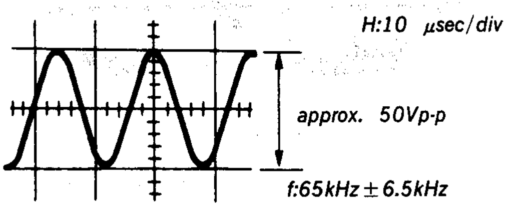


Fig. 5-30. Bias Oscillator Frequency Check

6. Record Bias Adjustment (AU-26 Board)

Mode	Self-Record and Playback
Signal	333Hz and 7kHz
Measurement Point	Audio out terminal
Measurement Equipment	Level meter and Attenuator
Adjustment Element	RV902
Specified Value	0±1dB

- Check that the Tape path adjustment and the playback output level adjustment have been performed.

[Adjustment Method]

(1) Connect Pin ⑭ of IC902 and GND with a jumper wire so as to turn off the AGC operation.

(2) Supply a 333Hz signal to the audio line input.

(3) Connect level meter to audio line output.

(4) Adjust attenuator so that the level meter becomes −30dBs.

(5) Record

(6) Record by making the audio line input signal into 7kHz.

(7) Playback the recorded portion, and measure the output level of 333Hz and 7kHz.

(8) Confirm that the 7kHz playback output level against the 333Hz playback level is 0±1dB. When it is out of specifications, adjust RV902 and repeat items (2) to (8).

(9) Remove the jumper wire.

7. Overall Level Characteristics and Distortion Ratio Checks.

Mode	Self-Record and Playback
Signal	333Hz, −10dBs
Measurement Point	Audio out terminal
Measurement Equipment	Level meter and Distortion meter
Specified Value	Playback level is −10±3dBs Distortion ratio is within 5%

[Confimation Method]

(1) Record

(2) Playback the recorded portion.

(3) Connect the level meter and distortion meter to the audio line output pin.

(4) Confirm that the playback level is−10±3dBs.

(5) Confirm that the distortion ratio is within 4%

8. Overall S/N Check (AU-26 Board)

Mode	Self-Record and Playback
Signal	333Hz and None
Measurement Point	Audio out terminal
Measurement Equipment	Level meter and Attenuater
Specified Value	S/N : More than 33dB

[Confimation Method]

(1) Connect jumper wire between Pin ⑭ of IC902 and GND and turn off off AGC operation

(2) Supply a 333Hz signal to the audio line input and adjust attenuator so that the level meter becomes −10dBs

(3) Record

(4) Switch to no-signalinput while continuing in record mode (Audio Input Pin is short)

(5) Playback the recorded portion, and confirm that the level difference between the 333Hz signal and no-signal portion (the portion immediately after the 333Hz signal) is more than 33dB

(6) Remove jumper wire.

5-6. TUNER SYSTEM ADJUSTMENT

1. RF AGC Adjustment (ST-12 Board)

Mode	E-E
Signal	VHF TV broad cast signal
Measurement Equipment	Monitor TV
Adjustment Element	IF001
Specified Value	Snow noise disappears point

[Adjustment Method]

(1) Adjust the monitor TV for best contrast

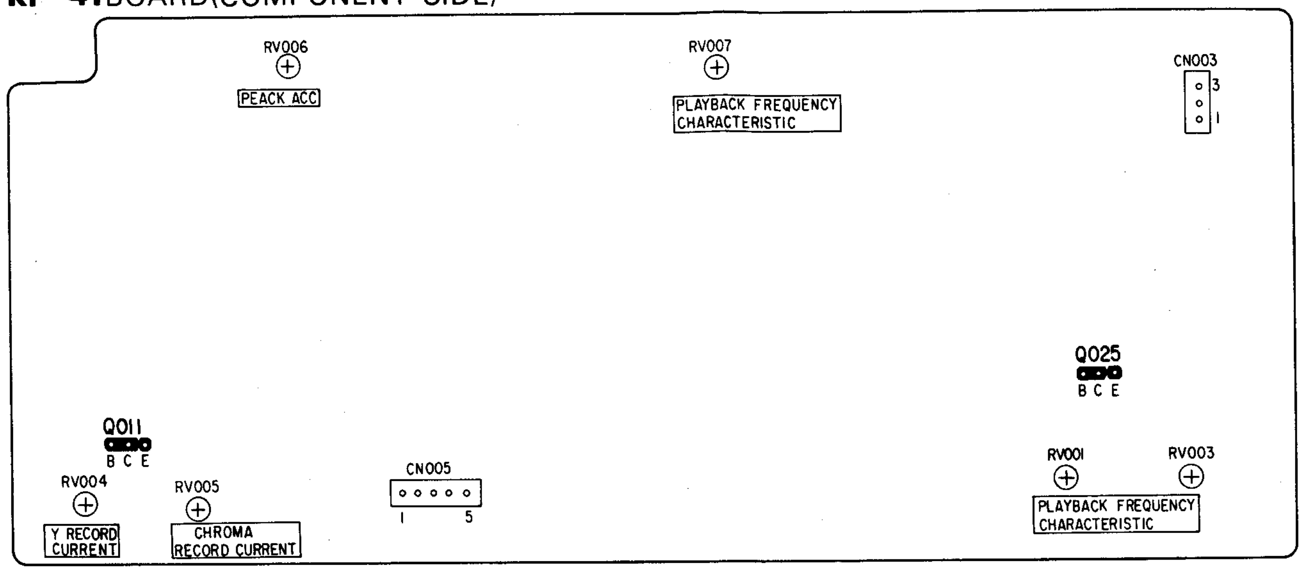
(2) Adjust IF001 so that show noise is visible

(3) Turn IF001 in the opposite direction to that in (2) and set at the point where snow noise disappears.

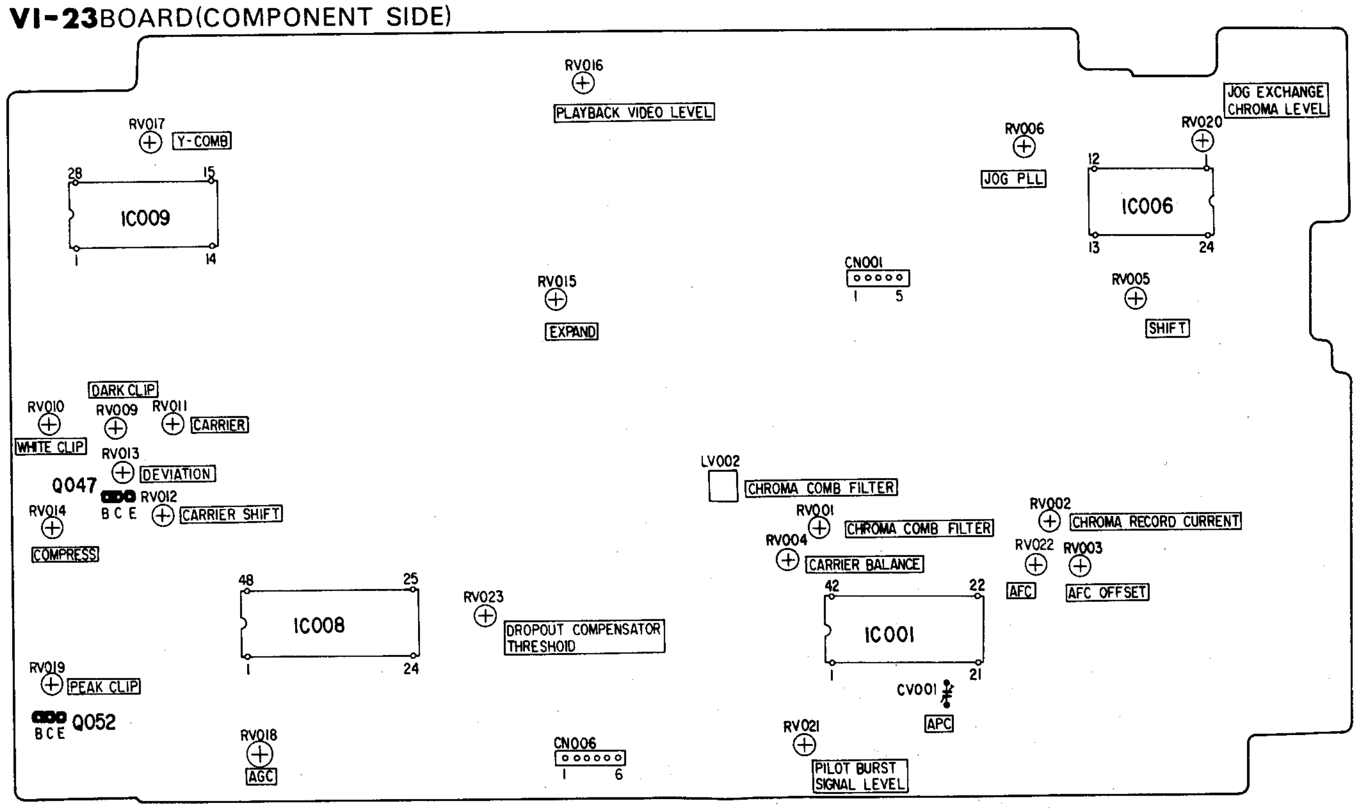
(4) Receive each channel and confirm that there is no beat picture disturbance or snow noise.

5-7. ADJUSTMENT ELEMENT LOCATION

RP-41BOARD(COMPONENT SIDE)


RV006
PEACK ACC
RV007
PLAYBACK FREQUENCY CHARACTERISTIC
CN003
3
1
Q025
B C E
Q011
B C E
RV004
Y RECORD CURRENT
RV005
CHROMA RECORD CURRENT
CN005
1
5
RV001
RV003
PLAYBACK FREQUENCY CHARACTERISTIC

VI-23BOARD(COMPONENT SIDE)


RV016
PLAYBACK VIDEO LEVEL
RV017
Y-COMB
28
15
IC009
1
14
RV006
JOG PLL
RV020
JOG EXCHANGE CHROMA LEVEL
12
IC006
13
24
CN001
1
5
RV015
EXPAND
RV005
SHIFT
DARK CLIP
RV010
RV009
RV011
CARRIER
WHITE CLIP
RV013
DEVIATION
Q047
RV012
B C E
CARRIER SHIFT
RV014
COMPRESS
LV002
CHROMA COMB FILTER
RV001
CHROMA COMB FILTER
RV004
CARRIER BALANCE
RV002
CHROMA RECORD CURRENT
RV022
RV003
AFC
AFC OFFSET
48
25
IC008
1
24
RV023
DROPOUT COMPENSATOR THRESHOID
42
22
IC001
1
21
CV001
APC
RV019
PEAK CLIP
Q052
B C E
RV018
AGC
CN006
1
6
RV021
PILOT BURST SIGNAL LEVEL

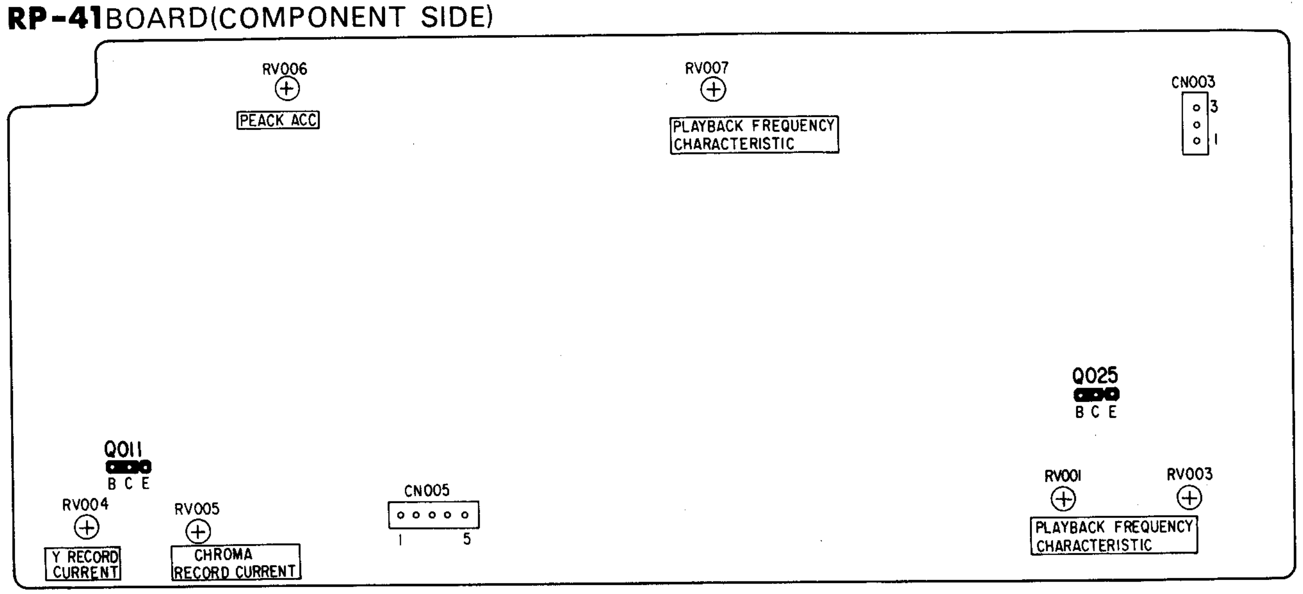
signal

point

t·
ble
hat in (2)
sappears.
ere is no

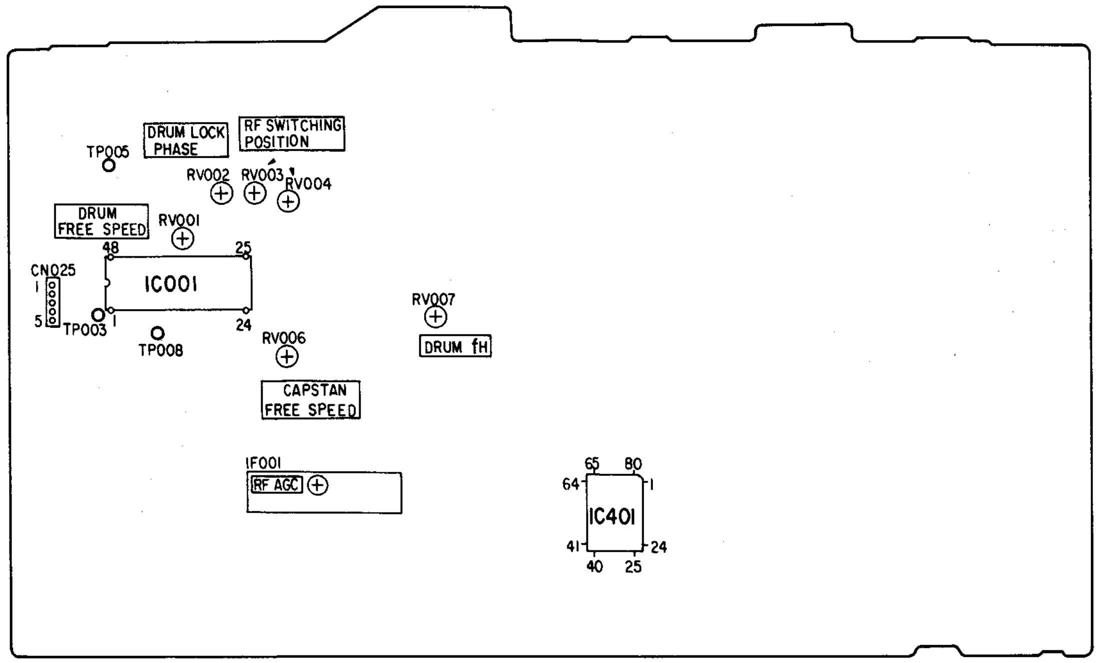
5-7. ADJUSTMENT ELEMENT LOCATION

RP-41 BOARD(COMPONENT SIDE)



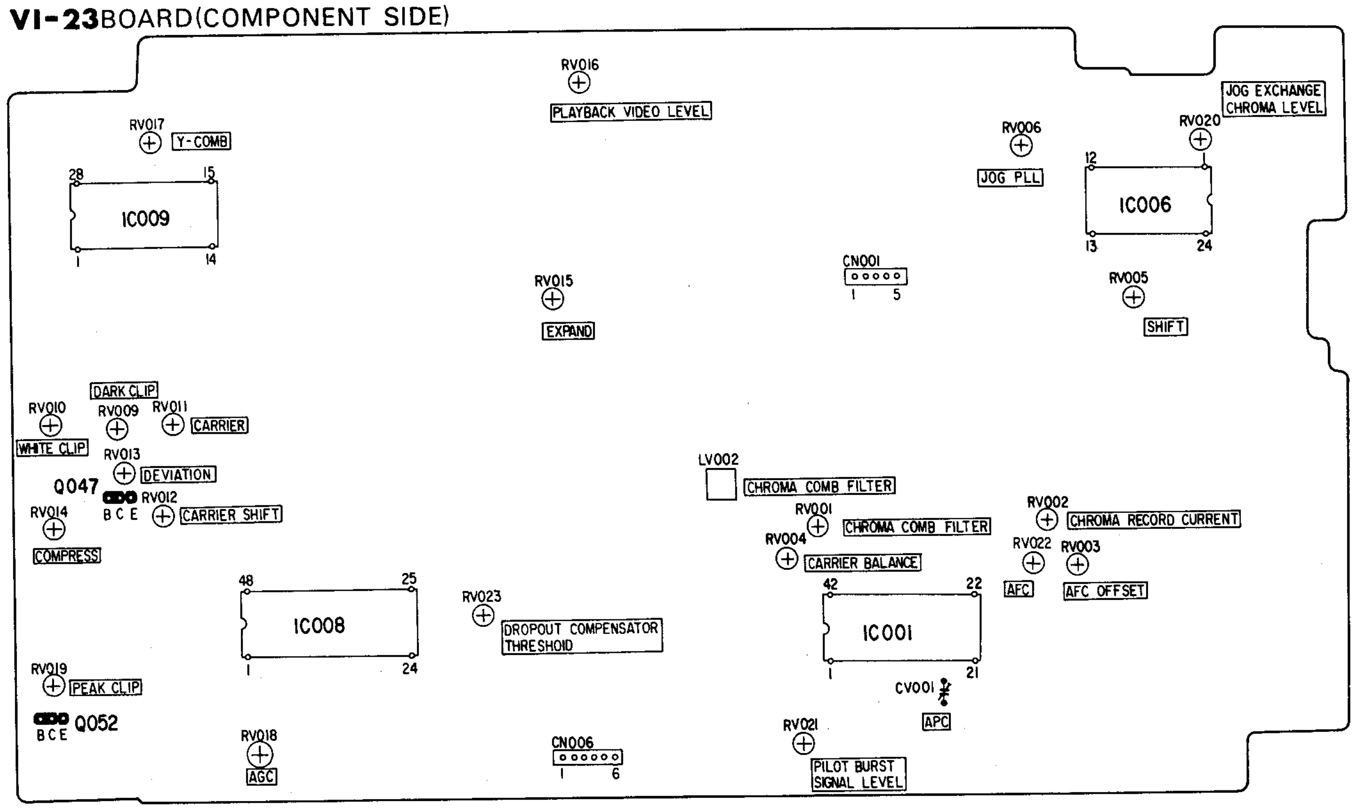
RV006
PEACK ACC
RV007
PLAYBACK FREQUENCY CHARACTERISTIC
CN003
3
1
Q025
B C E
Q011
B C E
RV004
Y RECORD CURRENT
RV005
CHROMA RECORD CURRENT
CN005
1
5
RV001
RV003
PLAYBACK FREQUENCY CHARACTERISTIC

ST-12 BOARD(COMPONENT SIDE)



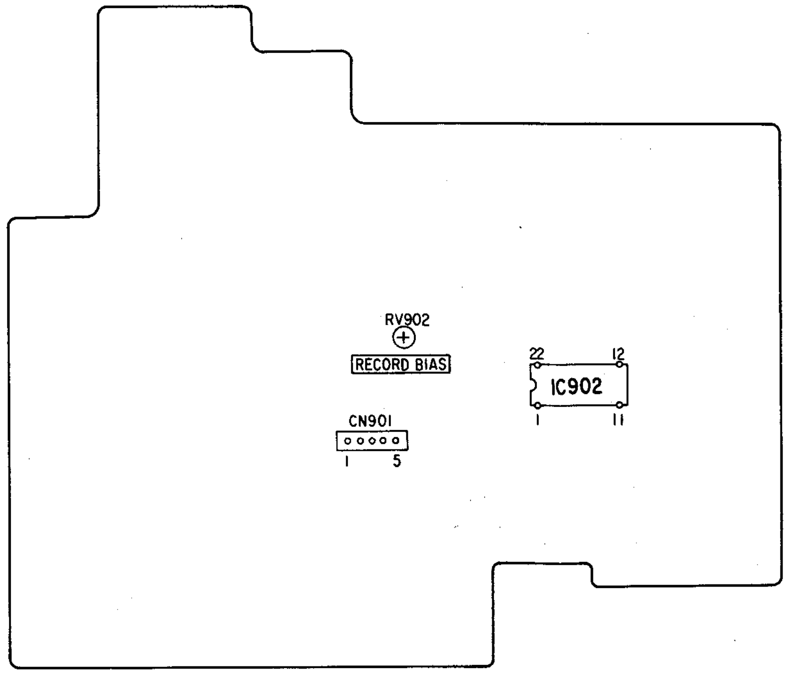
TP005
DRUM LOCK PHASE
RF SWITCHING POSITION
RV002
RV003
RV004
DRUM FREE SPEED
RV001
48
25
CN025
1
5
IC001
1
24
TP003
TP008
RV006
CAPSTAN FREE SPEED
RV007
DRUM fH
IF001
RF AGC
65
80
64
1
IC401
41
24
40
25

VI-23 BOARD(COMPONENT SIDE)



RV016
PLAYBACK VIDEO LEVEL
JOG EXCHANGE CHROMA LEVEL
RV017
Y-COMB
RV006
JOG PLL
RV020
28
15
IC009
1
14
12
1
IC006
13
24
RV015
EXPAND
CN001
1
5
RV005
SHIFT
DARK CLIP
RV010
RV009
RV011
CARRIER
WHITE CLIP
RV013
DEVIATION
Q047
RV012
B C E
CARRIER SHIFT
RV014
COMPRESS
LV002
CHROMA COMB FILTER
RV001
CHROMA COMB FILTER
RV004
CARRIER BALANCE
RV002
CHROMA RECORD CURRENT
RV022
RV003
AFC
AFC OFFSET
48
25
IC008
1
24
RV023
DROPOUT COMPENSATOR THRESHOLD
42
22
IC001
1
21
CV001
APC
RV019
PEAK CLIP
Q052
B C E
RV018
AGC
CN006
1
6
RV021
PILOT BURST SIGNAL LEVEL

AU-26 BOARD (COMPONENT SIDE)

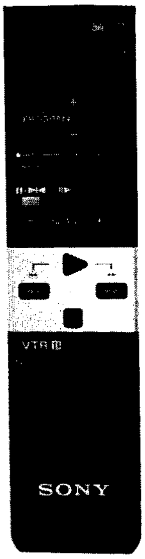


RV902
RECORD BIAS
22
12
IC902
1
11
CN901
1
5

- 180 kd

RMT-146

SERVICE MANUAL



SPECIFICATIONS

Remote control system	Infrared control
Power requirements	3 V DC, 2 IEC designation R6 batteries (size AA)
Dimensions	45 × 20 × 175 mm (W/H/D) incl. projecting parts and controls
Weight	Approx. 105 g incl. batteries

REMOTE COMMANDER

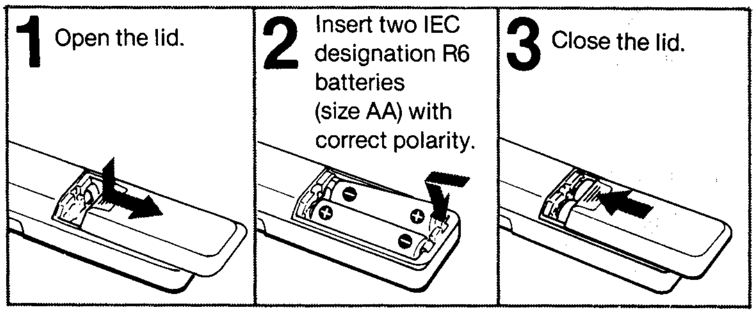
SONY®

ACC

1. REMOTE CONTROL OPEPATION

You can control almost all the functions of this video cassette recorder from your armchair using the supplied Remote Commander.

BATTERY INSERTION



1 Open the lid.

2 Insert two IEC designation R6 batteries (size AA) with correct polarity.

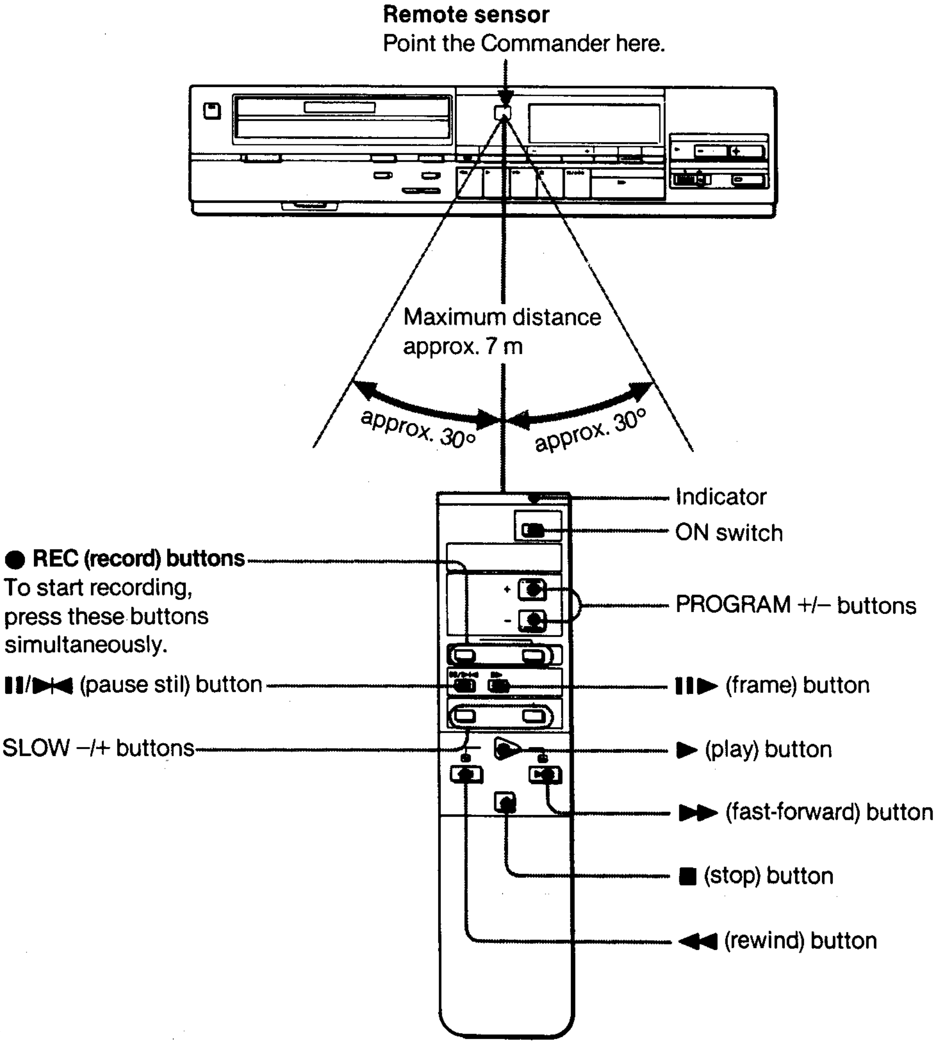
3 Close the lid.

Battery life

In normal operation, batteries will last for about six months.
When the batteries are exhausted, the indicator will not light when the buttons on the Commander are pressed.

If the Remote Commander is not to be used for a long period of time, remove the batteries to avoid possible damage caused by battery leakage.

OPERATION



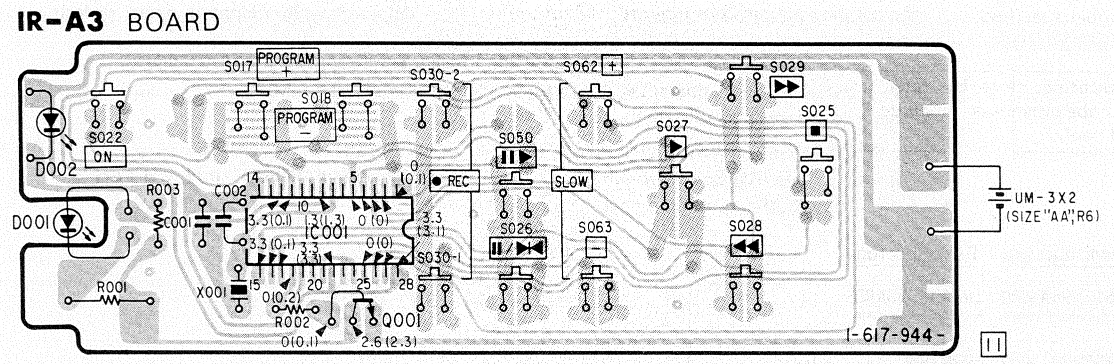
Remote sensor
Point the Commander here.

Maximum distance approx. 7 m

approx. 30°
approx. 30°
Indicator
ON switch
PROGRAM +/– buttons
▮▮▶ (frame) button
▶ (play) button
▶▶ (fast-forward) button
■ (stop) button
◀◀ (rewind) button
SLOW –/+ buttons
▮▮/▶◀ (pause stil) button

● REC (record) buttons
To start recording, press these buttons simultaneously.

2. PRINTED WIRING BOARD

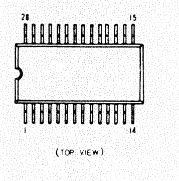

IR-A3 BOARD
S017
PROGRAM +
S018
PROGRAM –
S022
ON
S030-2
S030-1
● REC
S050
S062 +
SLOW
S063
S026
S027
S028
S029
S025
D001
D002
R001
R002
R003
C001
C002
X001
IC001
Q001
UM-3X2 (SIZE "AA", R6)
1-617-944-
11
3.3 (0.1)
3.3 (3.1)
0 (0)
0 (0.1)
0 (0.2)
2.6 (2.3)
14
5
10
15
20
25
28

Note:

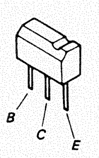
- ○— : indicates a lead wire mounted on the component side.
- ▨ : soldering side.
- ▨ : carbon pattern.
- ▨ : B+ Pattern.

SEMICONDUCTORS

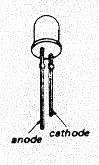
CX7947


28
15
1
14
(TOP VIEW)

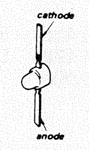
2SC2673



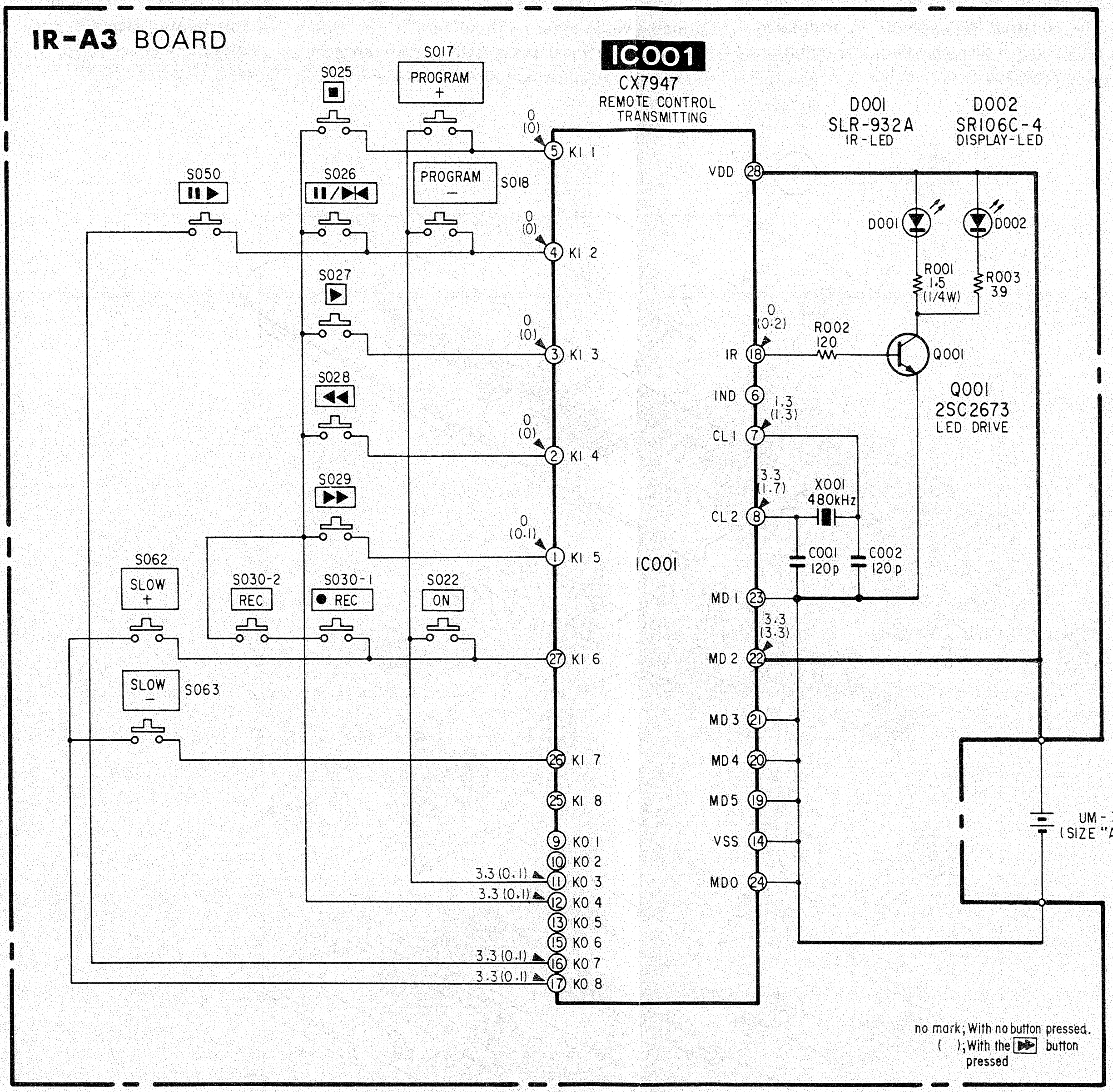
SLR-932A


anode
cathode

SR106C


cathode
anode

3. SCHEMATIC DIAGRAM


IR-A3 BOARD
IC001
CX7947
REMOTE CONTROL TRANSMITTING
S025 ■
S017 PROGRAM +
S018 PROGRAM –
S050 II▶
S026 II/▶I◀
S027 ▶
S028 ◀◀
S029 ▶▶
S062 SLOW +
S063 SLOW –
S030-2 REC
S030-1 ● REC
S022 ON
KI 1
KI 2
KI 3
KI 4
KI 5
KI 6
KI 7
KI 8
KO 1
KO 2
KO 3
KO 4
KO 5
KO 6
KO 7
KO 8
VDD
IR
IND
CL I
CL 2
MD I
MD 2
MD 3
MD 4
MD 5
VSS
MD0
D001 SLR-932A IR-LED
D002 SR106C-4 DISPLAY-LED
R001 1.5 (1/4W)
R002 120
R003 39
Q001 2SC2673 LED DRIVE
X001 480kHz
C001 120p
C002 120p
UM-3X2 (SIZE "AA", R6)
0 (0)
0 (0.1)
0 (0.2)
1.3 (1.3)
3.3 (1.7)
3.3 (3.3)
3.3 (0.1)
no mark; With no button pressed.
( ); With the ▶▶ button pressed

Note:

- All resistors are in ohms, 1/6W unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics. and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ━━ : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

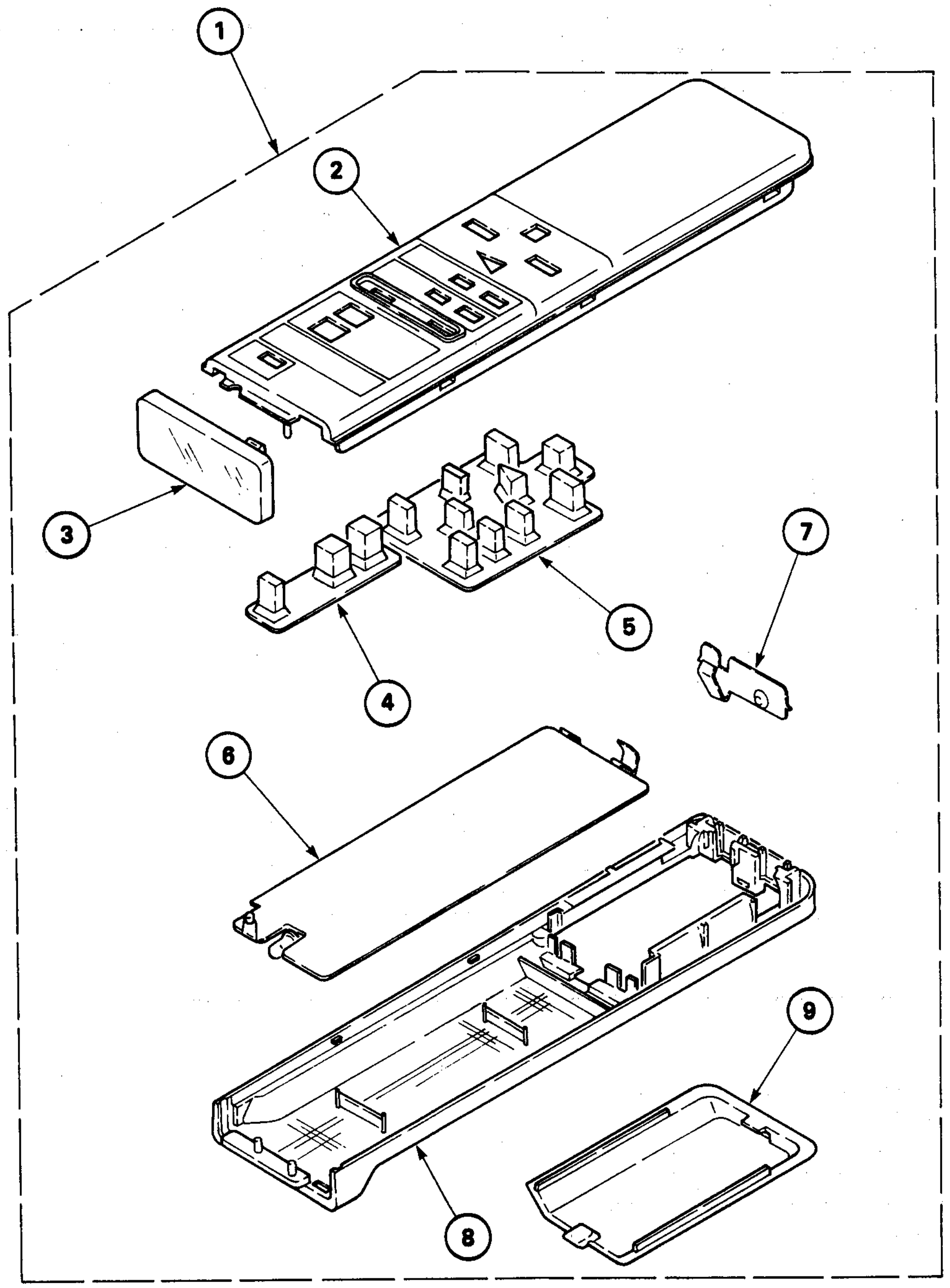
When indicating parts by reference number, please include the board name.

4. EXPLODED VIEW

NOTE:

- Itmes with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.



No.	Part No.	Description	Remark
1	A-6767-240-A	COMMANDER ASSY (RMT-146)	
2	X-2357-234-1	CASE ASSY, UPPER	
3	2-357-208-01	PANEL, FRONT, COMMANDER	
4	2-357-209-01	RUBBER (A), CONTACT	
5	2-357-261-01	RUBBER, CONTACT	
6	*1-617-944-11	IR-A3 BOARD	
7	4-350-925-00	TERMINAL (C), BATTERY	
8	2-357-207-01	CASE, LOWER	
9	2-387-105-11	COVER, BATTERY	

5. ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms
- F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS

- MF : μF, PF : μμF

COILS

- MMH : mH, UH : μH

Ref.No	Part No.	Description				Remark
	*1-617-944-11	IR-A3 BOARD ************				
	2-357-201-01	TERMINAL (A), BATTERY				
	2-357-202-01	TERMINAL (B), BATTERY				
		CAPACITOR				
C001	1-102-107-00	CERAMIC	120PF	10%	50V	
C002	1-102-107-00	CERAMIC	120PF	10%	50V	
		DIODE				
D001	8-719-912-39	DIODE SLR-932A				
D002	8-719-107-95	DIODE SR106C-4				
		IC				
IC001	8-759-902-22	IC CX-7947				
		TRANSISTOR				
Q001	8-729-967-32	TRANSISTOR 2SC2673-Q				
		RESISTOR				
R001	1-247-073-00	CARBON	1.5	5%	1/4W	
R002	1-247-809-00	CARBON	120	5%	1/6W	
R003	1-247-797-00	CARBON	39	5%	1/6W	
		CRYSTAL				
X001	1-527-476-00	OSCILLATOR, CERAMIC				

****

SL-F90
RMT-146

SONY®
SERVICE MANUAL

E Model

November, 1986

SUPPLEMENT-1

File this Supplement With the Service Manual.

EC Model Addition

An EC model has been added to SL-F90.

This EC model was designed based on the SL-F90 E(Spanish) model.

The differences from the SL-F90 E(Spanish) model are in the tuner block and accessory block remote commander.

This Supplement-1 includes only the differences from the SL-F90 E(Spanish) model.

SPECIFICATIONS

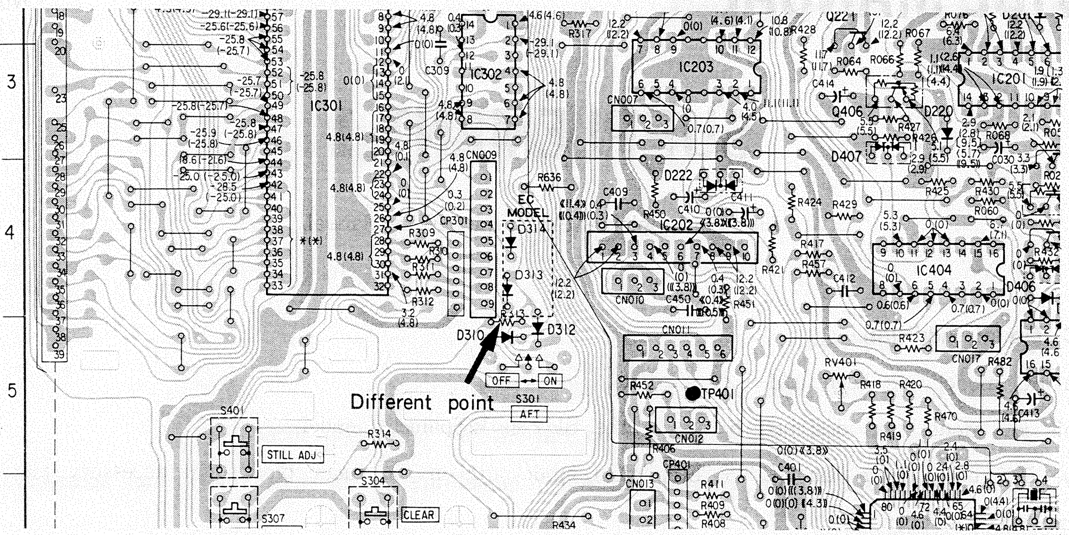
E(Spanish) Model	EC Model
SYSTEM	**SYSTEM**
Video recording system Rotary two-head helical scanning	Video recording system Rotary two-head helical scanning
Video signal CCIR standards, and PAL color	Video signal CCIR standards, and PAL color
Channel coverage VHF: Western European channels E2-E12 UHF: Western European channels E21-E68 (Up to 30 programs can be preset)	Channel coverage VHF: Western European channels E2-U10 UHF: Western European channels E21-E69 (Up to 30 programs can be preset)
Aerial input 75 ohms, asymmetrical aerial socket	Aerial input 75 ohms, asymmetrical aerial socket
RF output signal UHF channels E30 to E39 (variable) 75 ohm, unbalanced	RF output signal UHF channels E30 to E39 (variable) 75 ohm, unbalanced
SUPPLIED ACCESSORIES	**SUPPLIED ACCESSORIES**
75 ohm coaxial cable for recorder to TV connection 1	75 ohm coaxial cable for recorder to TV connection 1
Screwdriver for RF channel adjustment 1	Screwdriver for RF channel adjustment 1
Remote Commander RMT-146 with two IEC designation R6 batteries (size AA) 1	Remote Commander RMT-228 with two IEC designation R6 batteries (size AA) 1
Design and specifications are subject to change without notice.	Design and specifications are subject to change without notice.

MICROFILM

SCHEMATIC DIAGRAM AND PRINTED WIRING BOARDS

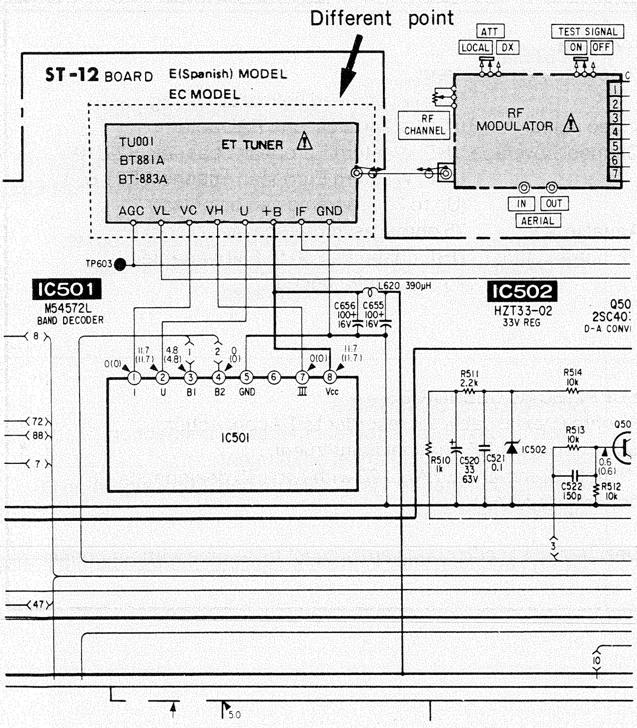
ST-12 (SYSTEM CONTROL/SERVO, TUNER, TIMER) PRINTED WIRING BOARD

Page 75

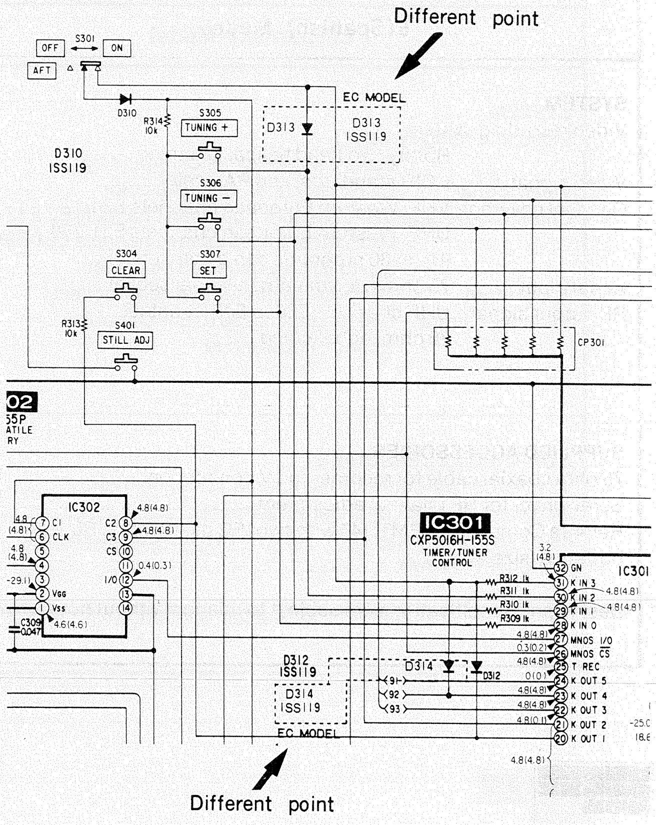

3
4
5
IC301
IC302
IC203
IC202
IC201
IC404
CN007
CN009
CN010
CN011
CN012
CN013
CN017
CP301
CP401
EC MODEL
D310
D312
D313
D314
D222
D220
D406
D407
Q221
Q406
R636
R317
S301
AFT
OFF
ON
S401
STILL ADJ
S304
CLEAR
S307
R314
R312
R309
TP401
RV401
Different point

ST-12 (SYSTEM CONTROL/SERVO, TUNER, TIMER) SCHEMATIC DIAGRAM

Page 79


Different point
ST-12 BOARD E(Spanish) MODEL
EC MODEL
TU001
BT881A
BT-883A
ET TUNER
AGC VL VC VH U +B IF GND
ATT
LOCAL DX
TEST SIGNAL
ON OFF
RF CHANNEL
RF MODULATOR
IN OUT
AERIAL
TP603
IC501
M54572L
BAND DECODER
IC502
HZT33-02
33V REG
L620 390μH
C656 100μ 16V
C655 100μ 16V
R511 2.2k
R514 10k
R513 10k
R510 1k
C520 33 63V
C521 0.1
C522 150p
R512 10k
IC501

Page 82


Different point
S301
OFF
ON
AFT
D310
D310 ISS119
R314 10k
S305
TUNING +
S306
TUNING −
S304
CLEAR
S307
SET
R313 10k
S401
STILL ADJ
EC MODEL
D313
D313 ISS119
CP301
IC302
IC301
CXP5016H-155S
TIMER/TUNER CONTROL
R312 1k
R311 1k
R310 1k
R309 1k
K IN 3
K IN 2
K IN 1
K IN 0
MNOS I/O
MNOS CS
T REC
K OUT 5
K OUT 4
K OUT 3
K OUT 2
K OUT 1
D312 ISS119
D314 ISS119
EC MODEL
C309 0.047
Different point

EXPLODED VIEWS

NOTE:

- Itmes with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Page 102

5-2. TUNER, TIMER AND POWER ASSEMBLY

	E (Spanish) Model		EC Model	
No.	Part No.	Description	Part No.	Description
61	⚠1-463-584-11	TUNER, ET(BT-881A)	⚠1-463-577-11	TUNER, ET(BT-883A)
63	⋆A-6715-332-A	ST-12 BOARD, COMPLETE	⋆A-6715-340-A	ST-12 BOARD, COMPLETE

ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms
- F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS

- MF : μF, PF : μμF

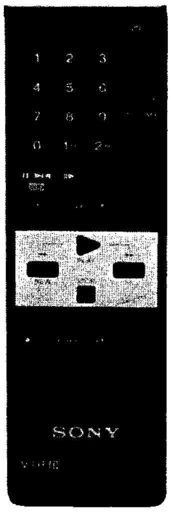
COILS

- MMH : mH, UH : μH

			E (Spanish) Model		EC Model	
Page	BOARD	Ref. No	Part No.	Description	Part No.	Description
119	ST-12	—	⋆A-6715-332-A	ST-12 BOARD, COMPLETE	⋆A-6715-340-A	ST-12 BOARD, COMPLETE
120		D313	——	——	8-719-911-19	DIODE ISS119
		D314	——	——	8-719-911-19	DIODE ISS119
123		TU001	⚠1-463-584-11	TUNER, ET(BT-881A)	⚠1-463-577-11	TUNER, ET(BT-883A)
125	ACCESSORIES AND PACKING MATERIALS	—	A-6767-240-A	COMMANDER ASSY (RMT-146)	A-6767-352-A	COMMANDER ASSY (RMT-228)
		—	3-701-625-00	BAG, POLYETHYLENE	3-701-628-00	BAG, POLYETHYLENE
		—	3-765-539-41	MANUAL, INSTRUCTION (English, Spanish)	3-765-539-51	MANUAL, INSTRUCTION (English, French, Dutch)

RMT-228

SERVICE MANUAL



SPECIFICATIONS

Remote Commander RMT-228

Remote control system	Infrared control
Power requirements	3 V DC, 2 IEC designation R6 batteries (size AA)
Dimensions	55 × 20 × 175 mm (W/H/D) incl. projecting parts and controls
Weight	Approx. 140 g incl. batteries

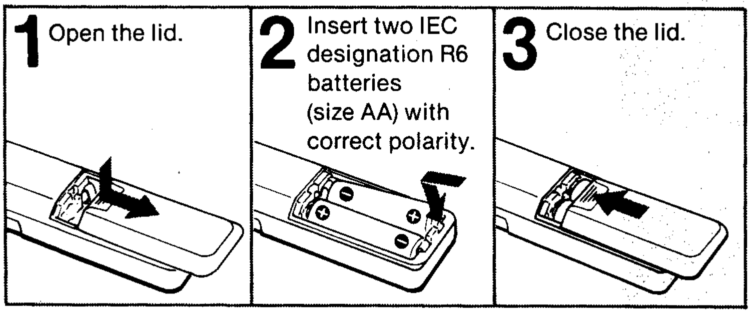
REMOTE COMMANDER

SONY®

1. REMOTE CONTROL OPERATION

You can control almost all the functions of this video cassette recorder from your armchair using the supplied Remote Commander.

BATTERY INSERTION



1 Open the lid.

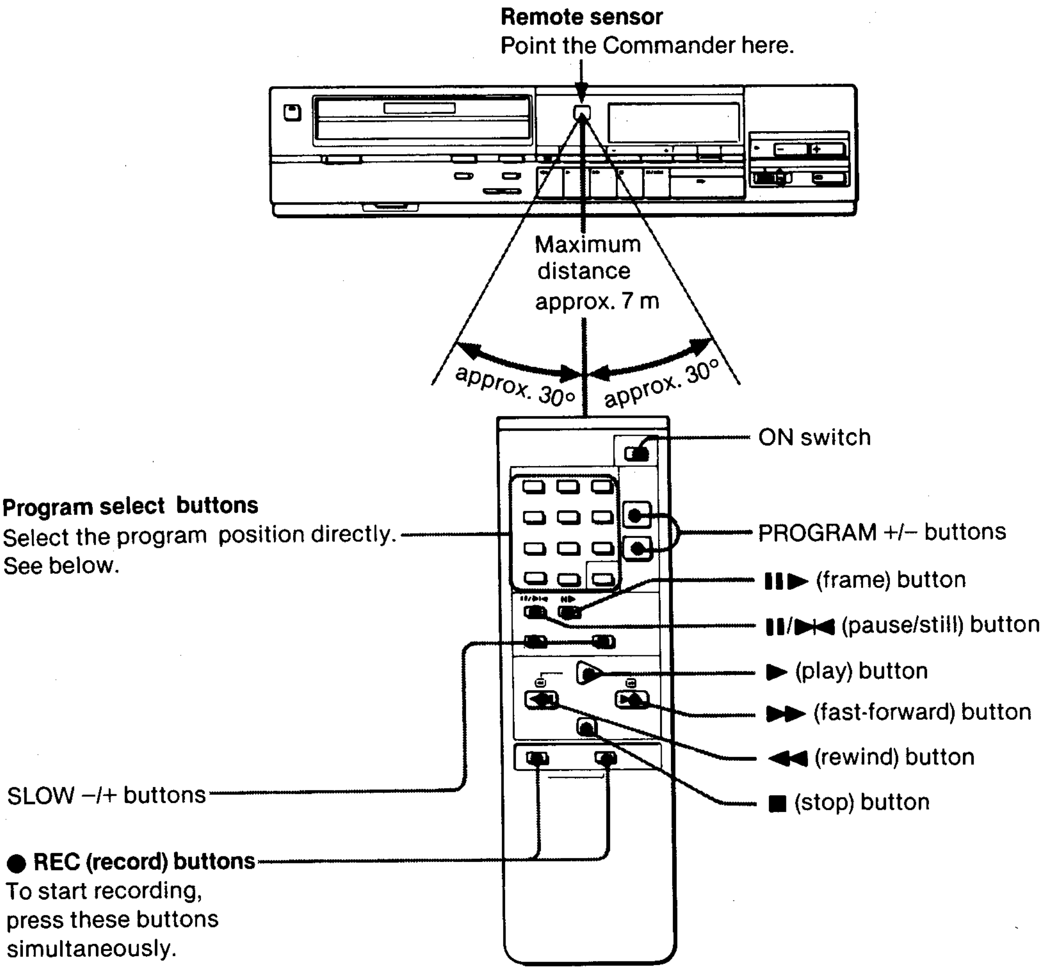
2 Insert two IEC designation R6 batteries (size AA) with correct polarity.

3 Close the lid.

Battery life
In normal operation, batteries will last for about six months.

If the Remote Commander is not to be used for a long period of time, remove the batteries to avoid possible damage caused by battery leakage.

OPERATION



Remote sensor
Point the Commander here.

ON switch

PROGRAM +/– buttons

II▶ (frame) button

II/▶◀ (pause/still) button

▶ (play) button

▶▶ (fast-forward) button

◀◀ (rewind) button

■ (stop) button

Program select buttons
Select the program position directly. See below.

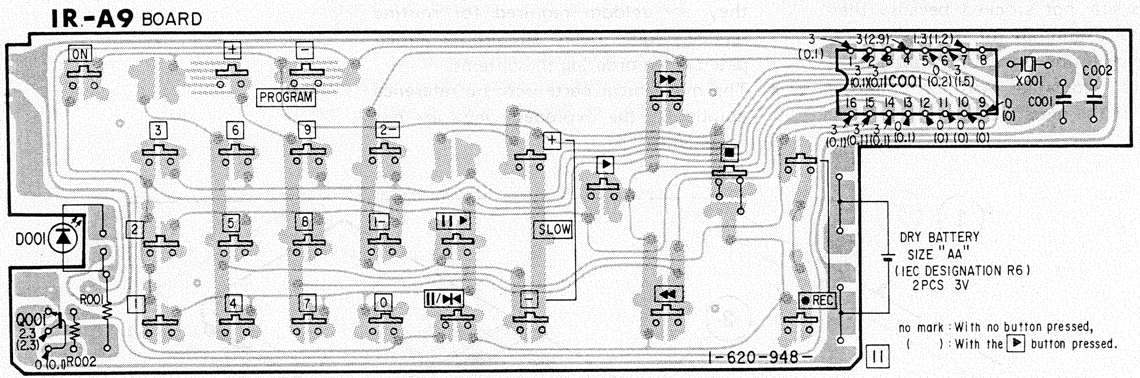
SLOW –/+ buttons

● REC (record) buttons
To start recording, press these buttons simultaneously.

How to press the program select buttons
For programs 1 through 9, press the corresponding single-digit button.
For 10 through 19, press "1-" for the tens-digit and then the corresponding single-digit button.
For 20 through 29, press "2-" and then the corresponding single-digit button.
For 30, press "0".

- If you do not press a single-digit button within several seconds after pressing "1-" or "2-", the previous program position will be recalled.

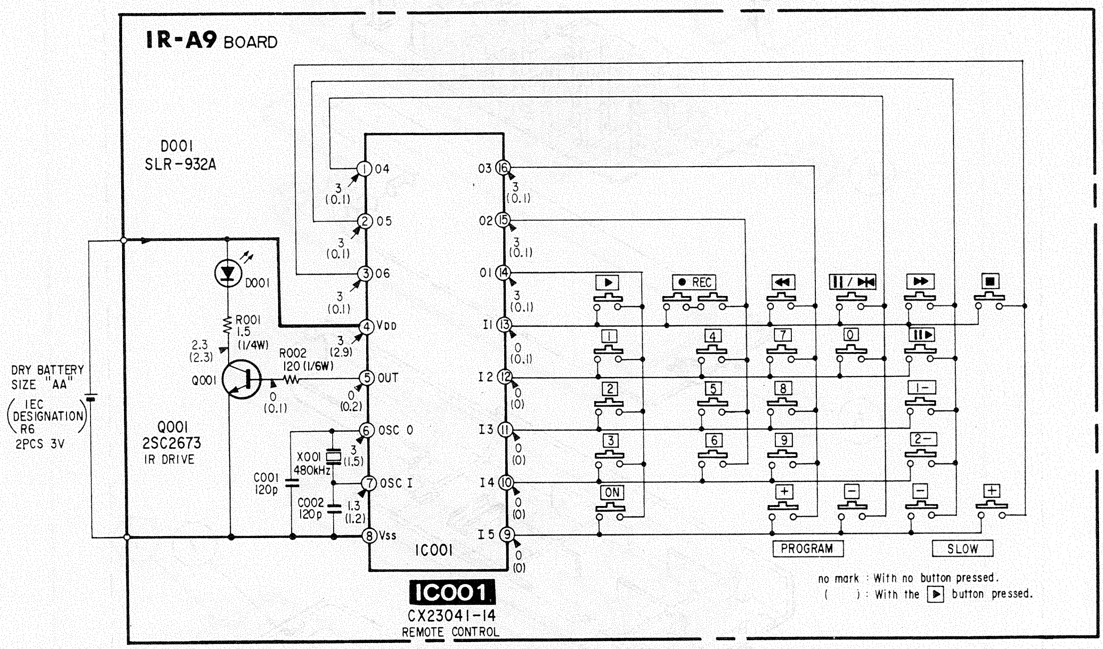
2. PRINTED WIRING BOARD


IR-A9 BOARD
ON
+
−
PROGRAM
3
6
9
2−
+
▶
■
2
5
8
1−
II▶
SLOW
1
4
7
0
II/▶◀
−
◀◀
● REC
▶▶
D001
Q001
2.3
(2.3)
R001
0 (0.1) R002
3 (0.1)
3 (2.9)
1.3 (1.2)
IC001
(0.2) (1.5)
X001
C001
C002
16 15 14 13 12 11 10 9
(0) (0) (0)
1-620-948
DRY BATTERY
SIZE "AA"
(IEC DESIGNATION R6)
2PCS 3V
no mark : With no button pressed,
( ) : With the ▶ button pressed.

Note:

- ○— : indicates a lead wire mounted on the component side.
- ▨ : soldering side.
- ▨ : carbon pattern.
- ▨ : B+ Pattern.

3. SCHEMATIC DIAGRAM

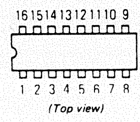

IR-A9 BOARD
D001
SLR-932A
DRY BATTERY
SIZE "AA"
(IEC DESIGNATION R6)
2PCS 3V
R001
1.5
(1/4W)
2.3
(2.3)
Q001
R002
120 (1/6W)
Q001
2SC2673
IR DRIVE
X001
480kHz
C001
120p
C002
120p
1 O4
2 O5
3 O6
4 VDD
5 OUT
6 OSC O
7 OSC I
8 VSS
O3 16
O2 15
O1 14
I1 13
I2 12
I3 11
I4 10
I5 9
IC001
CX23041-14
REMOTE CONTROL
▶
● REC
◀◀
II/▶◀
▶▶
■
1
4
7
0
II▶
2
5
8
1−
3
6
9
2−
ON
+
−
−
+
PROGRAM
SLOW
no mark : With no button pressed.
( ) : With the ▶ button pressed.

Note:

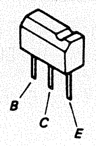
- All resistors are in ohms, 1/6W unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics. and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ☐ : panel designation.
- ▬ : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

SEMICONDUCTORS

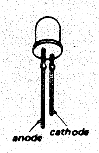
CX23041-14


16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
(Top view)

2SC2673



SLR-932A


anode
cathode

4. EXPLODED VIEW

NOTE:

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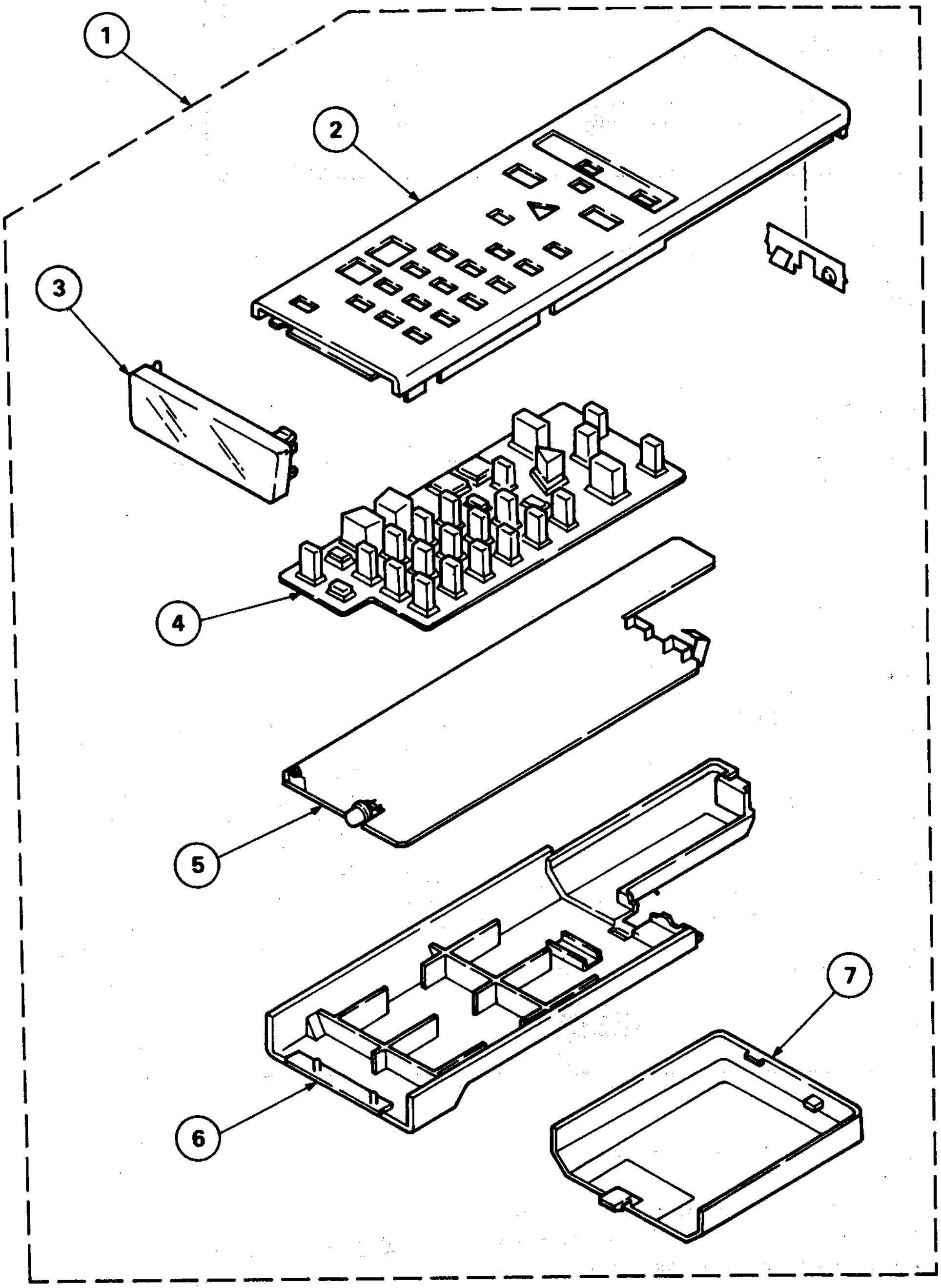
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.



No.	Part No.	Description	Remark
1	A-6767-352-A	COMMANDER ASSY (RMT-228)	2-7
2	X-2357-244-1	CASE ASSY, UPPER	
3	2-387-133-01	PLATE, FROSTED	
4	2-357-284-01	RUBBER (J), CONTACT	
5	*1-620-948-11	IR-A9 BOARD	
6	2-357-248-01	CASE LOWER	
7	2-357-245-01	COVER, BATTERY	

5. ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms
- F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS

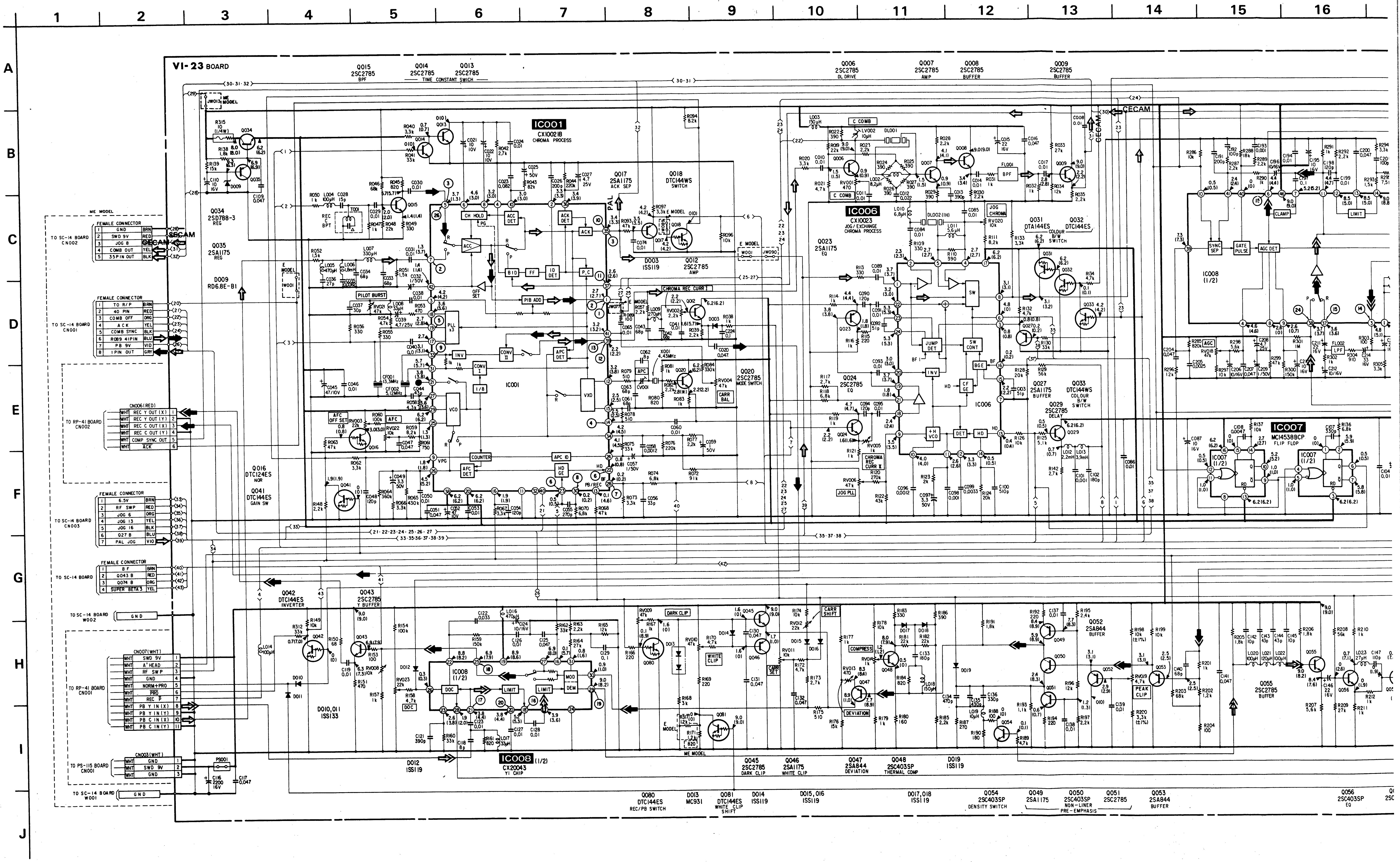
- MF : μF, PF : μμF

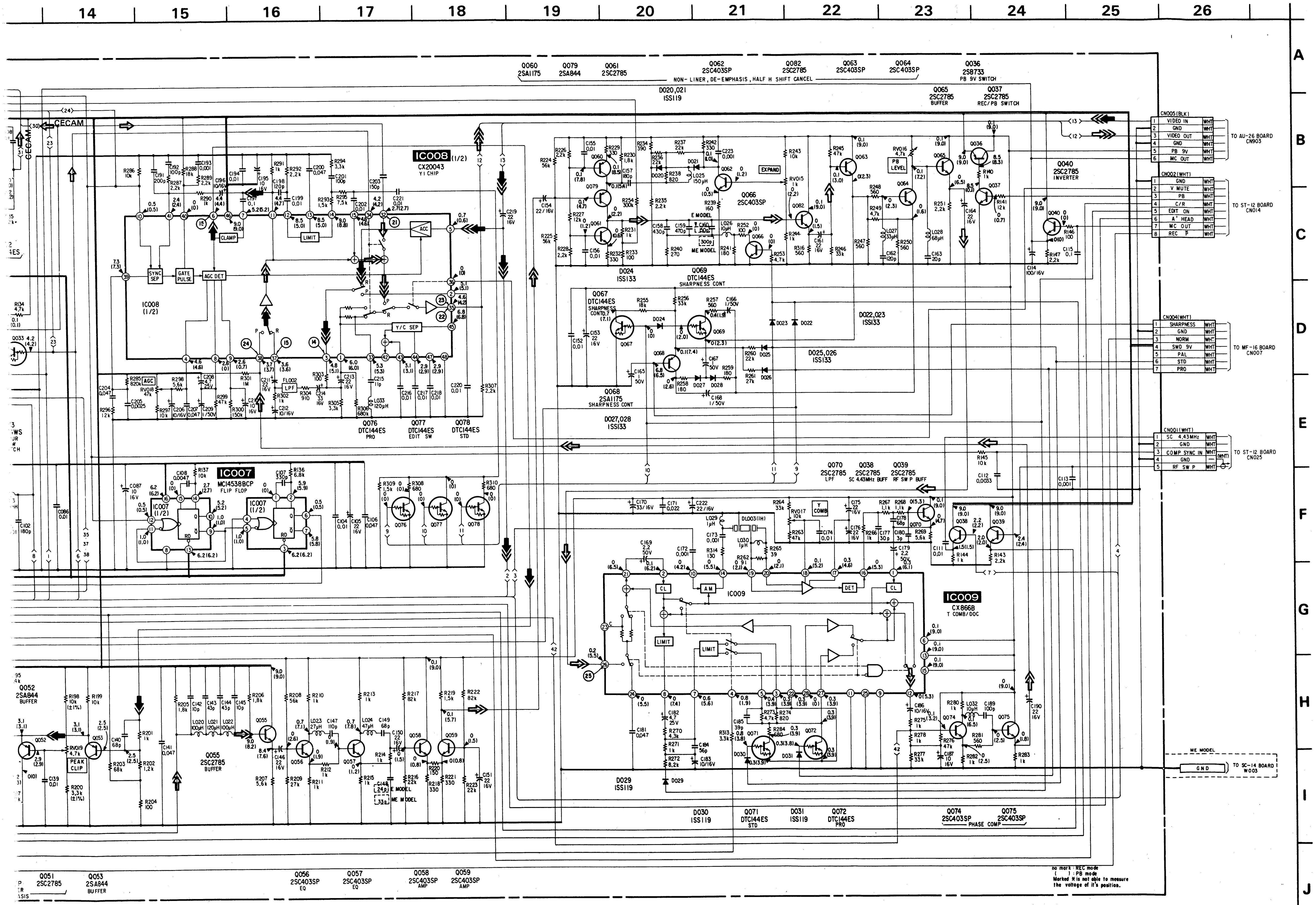
COILS

- MMH : mH, UH : μH

Ref.No	Part No.	Description	Remark
	*1-620-948-11	IR-A9 BOARD ************	
	2-387-103-01	TERMINAL (A), BATTERY	
	2-387-104-01	TERMINAL (B), BATTERY	
		CAPACITOR	
C001	1-102-107-00	CERAMIC 120PF 10% 50V	
C002	1-102-107-00	CERAMIC 120PF 10% 50V	
		DIODE	
D001	8-719-912-39	DIODE SLR-932A	
		IC	
IC001	8-759-938-10	IC CX-23041-14	
		TRANSISTOR	
Q001	8-729-967-32	TRANSISTOR 2SC2673-Q	
		RESISTOR	
R001	1-247-073-00	CARBON 1.5 5% 1/4W	
R002	1-247-809-00	CARBON 120 5% 1/6W	
		CRYSTAL	
X001	1-527-476-00	OSCILLATOR, CERAMIC	

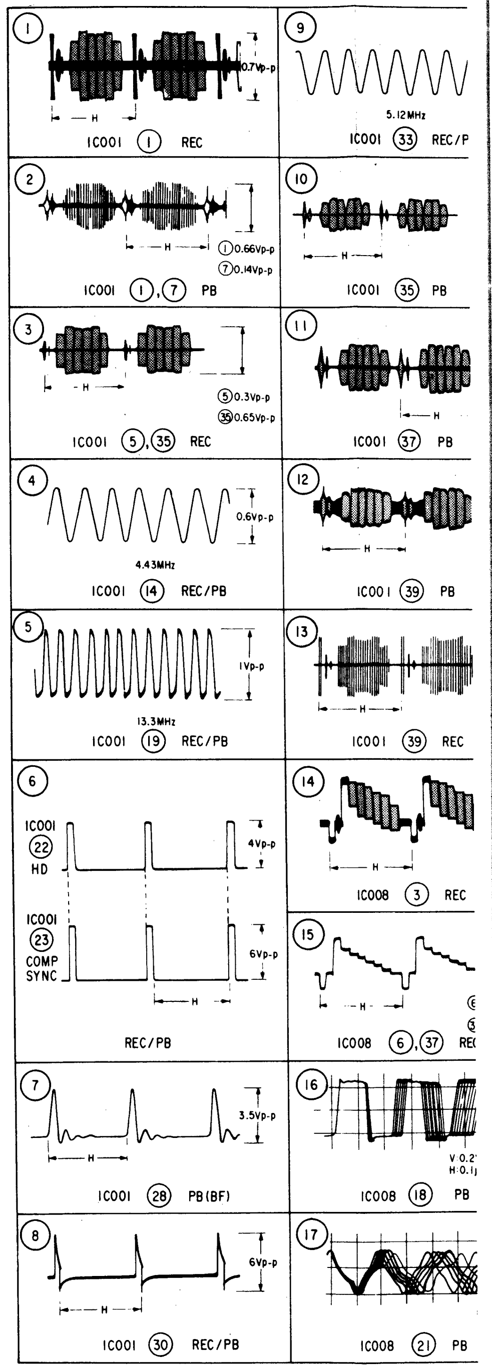
****

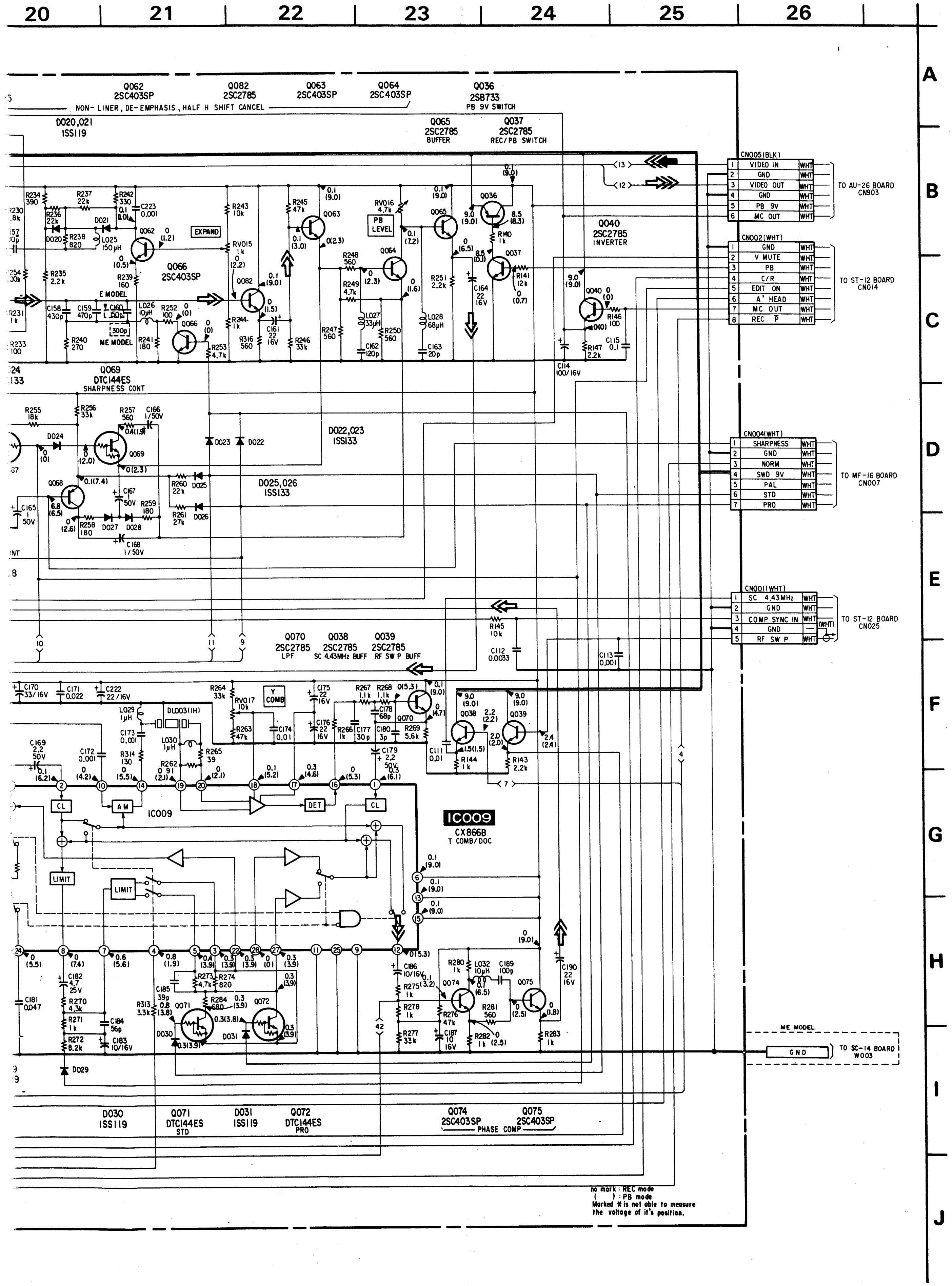

VI-23 BOARD
IC001 CX10021B CHROMA PROCESS
IC006 CX10023 JOG / EXCHANGE CHROMA PROCESS
IC007 MC14538BCP FLIP FLOP
IC008 (1/2) CX20043 Y1 CHIP
IC008 (1/2)
Q015 2SC2785 BPF
Q014 2SC2785
Q013 2SC2785
TIME CONSTANT SWITCH
Q034 2SD788-3 REG
Q035 2SA1175 REG
D009 RD6.8E-B1
Q017 2SA1175 ACK SEP
Q018 DTC144WS SWITCH
D003 1SS119
Q012 2SC2785 AMP
Q020 2SC2785 MODE SWITCH
Q016 DTC124ES NOR
Q041 DTC144ES GAIN SW
Q006 2SC2785 DL DRIVE
Q007 2SC2785 AMP
Q008 2SC2785 BUFFER
Q009 2SC2785 BUFFER
Q023 2SA1175 EQ
Q024 2SC2785 EQ
Q031 DTA144ES
Q032 DTC144ES
COLOUR B/W SWITCH
Q027 2SA1175 BUFFER
Q033 DTC144WS COLOUR B/W SWITCH
Q029 2SC2785 DELAY
IC008 (1/2)
IC007 (1/2)
Q042 DTC144ES INVERTER
Q043 2SC2785 Y BUFFER
D010, 011 1SS133
D012 1SS119
Q080 DTC144ES REC/PB SWITCH
D013 MC931
Q081 DTC144ES WHITE CLIP SHIFT
D014 1SS119
D015, 016 1SS119
Q045 2SC2785 DARK CLIP
Q046 2SA1175 WHITE CLIP
Q047 2SA844 DEVIATION
Q048 2SC403SP THERMAL COMP
D017, 018 1SS119
D019 1SS119
Q054 2SC403SP DENSITY SWITCH
Q049 2SA1175
Q050 2SC403SP NON-LINER
Q051 2SC2785
PRE-EMPHASIS
Q052 2SA844 BUFFER
Q053 2SA844 BUFFER
Q055 2SC2785 BUFFER
Q056 2SC403SP EQ
ME MODEL
E MODEL
SECAM
CECAM
FEMALE CONNECTOR
TO SC-14 BOARD CN002
TO SC-14 BOARD CN001
TO RP-41 BOARD CN002
TO SC-14 BOARD CN003
TO SC-14 BOARD
TO SC-14 BOARD W002
TO RP-41 BOARD CN001
TO PS-115 BOARD CN001
TO SC-14 BOARD W001
CN006 (RED)
CN007 (WHT)
CN003 (WHT)
GND
SWD 9V
JOG 8
COMB OUT
35PIN OUT
TO R/P
40 PIN
COMB OFF
ACK
COMB SYNC
R089 41PIN
PB 9V
1PIN OUT
REC Y OUT (X)
REC Y OUT (Y)
REC C OUT (X)
REC C OUT (Y)
COMP SYNC OUT
6.5V
RF SWP
JOG 6
JOG 13
JOG 16
Q27 B
PAL JOG
B F
Q043 B
Q074 B
SUPER BETA 3
A' HEAD
NORM+PRO
PRO
REC P
PB Y IN (X)
PB Y IN (Y)
PB C IN (X)
PB C IN (Y)
PS001
C COMB
DL001
DL002 (1H)
FL001
BPF
JOG CHROMA
CHROMA REC CURR I
CHROMA REC CURR II
JOG PLL
PILOT BURST
AFC
AFC OFF SET
CH HOLD
ACC DET
ACK DET
ACC
BID
FF
ID DET
P.C
PLL x3
INV
CONV I
CONV II
1/8
APC DET
APC
VXO
CARR BAL
VCO
COUNTER
AFC DET
APC ID
HD GE
VPG
JUMP DET
SW CONT
BGE
CF GE
+H VCO
DET
HD
SYNC SEP
GATE PULSE
AGC DET
AGC
CLAMP
LIMIT
LPF
DOC
LIMIT
MOD
DEM
DARK CLIP
WHITE CLIP
CARR SET
CARR SHIFT
COMPRESS
DEVIATION
PEAK CLIP
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J


14
15
16
17
18
19
20
21
22
23
24
25
26
A
B
C
D
E
F
G
H
I
J
Q060 2SA1175
Q079 2SA844
Q061 2SC2785
Q062 2SC403SP
Q082 2SC2785
Q063 2SC403SP
Q064 2SC403SP
NON-LINER, DE-EMPHASIS, HALF H SHIFT CANCEL
Q036 2SB733 PB 9V SWITCH
D020,021 ISS119
Q065 2SC2785 BUFFER
Q037 2SC2785 REC/PB SWITCH
CECAM
IC008 (1/2) CX20043 Y I CHIP
SYNC SEP
GATE PULSE
AGC DET
CLAMP
LIMIT
ACC
Y/C SEP
AGC
LPF
IC008 (1/2)
Q066 2SC403SP
EXPAND
E MODEL
ME MODEL
PB LEVEL
Q040 2SC2785 INVERTER
CN005(BLK)
VIDEO IN
GND
VIDEO OUT
GND
PB 9V
MC OUT
TO AU-26 BOARD CN903
CN002(WHT)
GND
V MUTE
PB
C/R
EDIT ON
A' HEAD
MC OUT
REC P
TO ST-12 BOARD CN014
D024 ISS133
Q069 DTC144ES SHARPNESS CONT
Q067 DTC144ES SHARPNESS CONT
D022,023 ISS133
D025,026 ISS133
Q068 2SA1175 SHARPNESS CONT
D027,028 ISS133
CN004(WHT)
SHARPNESS
GND
NORM
SWD 9V
PAL
STD
PRO
TO MF-16 BOARD CN007
Q076 DTC144ES PRO
Q077 DTC144ES EDIT SW
Q078 DTC144ES STD
CN001(WHT)
SC 4.43MHz
GND
COMP SYNC IN
GND
RF SW P
TO ST-12 BOARD CN025
IC007 MC14538BCP FLIP FLOP
IC007 (1/2)
RD
Q070 2SC2785 LPF
Q038 2SC2785 SC 4.43MHz BUFF
Q039 2SC2785 RF SW P BUFF
Y COMB
DL003(1H)
IC009 CX866B T COMB/DOC
AM
DET
CL
LIMIT
Q052 2SA844 BUFFER
PEAK CLIP
Q055 2SC2785 BUFFER
ME MODEL
GND
TO SC-14 BOARD W003
D029 ISS119
D030 ISS119
Q071 DTC144ES STD
D031 ISS119
Q072 DTC144ES PRO
Q074 2SC403SP
Q075 2SC403SP
PHASE COMP
Q051 2SC2785
Q053 2SA844 BUFFER
Q056 2SC403SP EQ
Q057 2SC403SP EQ
Q058 2SC403SP AMP
Q059 2SC403SP AMP

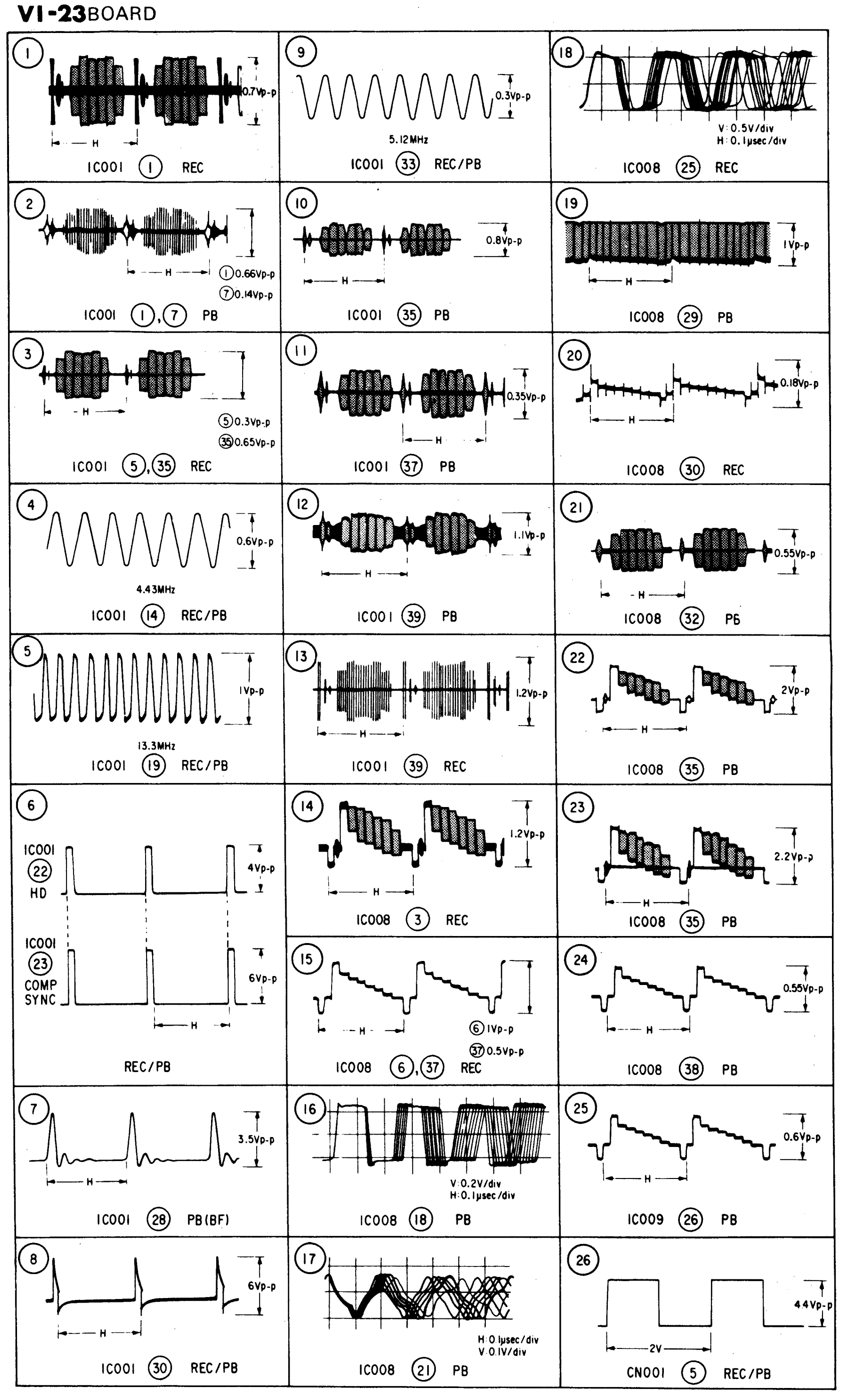
no mark : REC mode
( ) : PB mode
Marked ※ is not able to measure the voltage of it's position.

VI-23BOARD




20
21
22
23
24
25
26
A
B
C
D
E
F
G
H
I
J
Q062 2SC403SP
Q082 2SC2785
Q063 2SC403SP
Q064 2SC403SP
NON-LINER, DE-EMPHASIS, HALF H SHIFT CANCEL
Q036 2SB733 PB 9V SWITCH
D020,021 1SS119
Q065 2SC2785 BUFFER
Q037 2SC2785 REC/PB SWITCH
CN005(BLK)
VIDEO IN
GND
VIDEO OUT
GND
PB 9V
MC OUT
TO AU-26 BOARD CN903
Q040 2SC2785 INVERTER
CN002(WHT)
GND
V MUTE
PB
C/R
EDIT ON
A' HEAD
MC OUT
REC P
TO ST-12 BOARD CN014
Q066 2SC403SP
EXPAND
PB LEVEL
RV015
RV016
E MODEL
ME MODEL
Q069 DTC144ES SHARPNESS CONT
D022,023 1SS133
D025,026 1SS133
CN004(WHT)
SHARPNESS
GND
NORM
SWD 9V
PAL
STD
PRO
TO MF-16 BOARD CN007
CN001(WHT)
SC 4.43MHz
GND
COMP SYNC IN
GND
RF SW P
TO ST-12 BOARD CN025
Q070 2SC2785 LPF
Q038 2SC2785 SC 4.43MHz BUFF
Q039 2SC2785 RF SW P BUFF
Y COMB
RV017
DL003(1H)
IC009 CX866B T COMB/DOC
CL
AM
DET
LIMIT
ME MODEL
GND
TO SC-14 BOARD W003
D030 1SS119
Q071 DTC144ES STD
D031 1SS119
Q072 DTC144ES PRO
Q074 2SC403SP
Q075 2SC403SP
PHASE COMP
no mark : REC mode
( ) : PB mode
Marked ※ is not able to measure the voltage of it's position.

VI-23BOARD



Note:

- All resistors are in ohms, 1/4W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics. and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repair.
- ━ : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

When indicating parts by reference number, please include the board name.

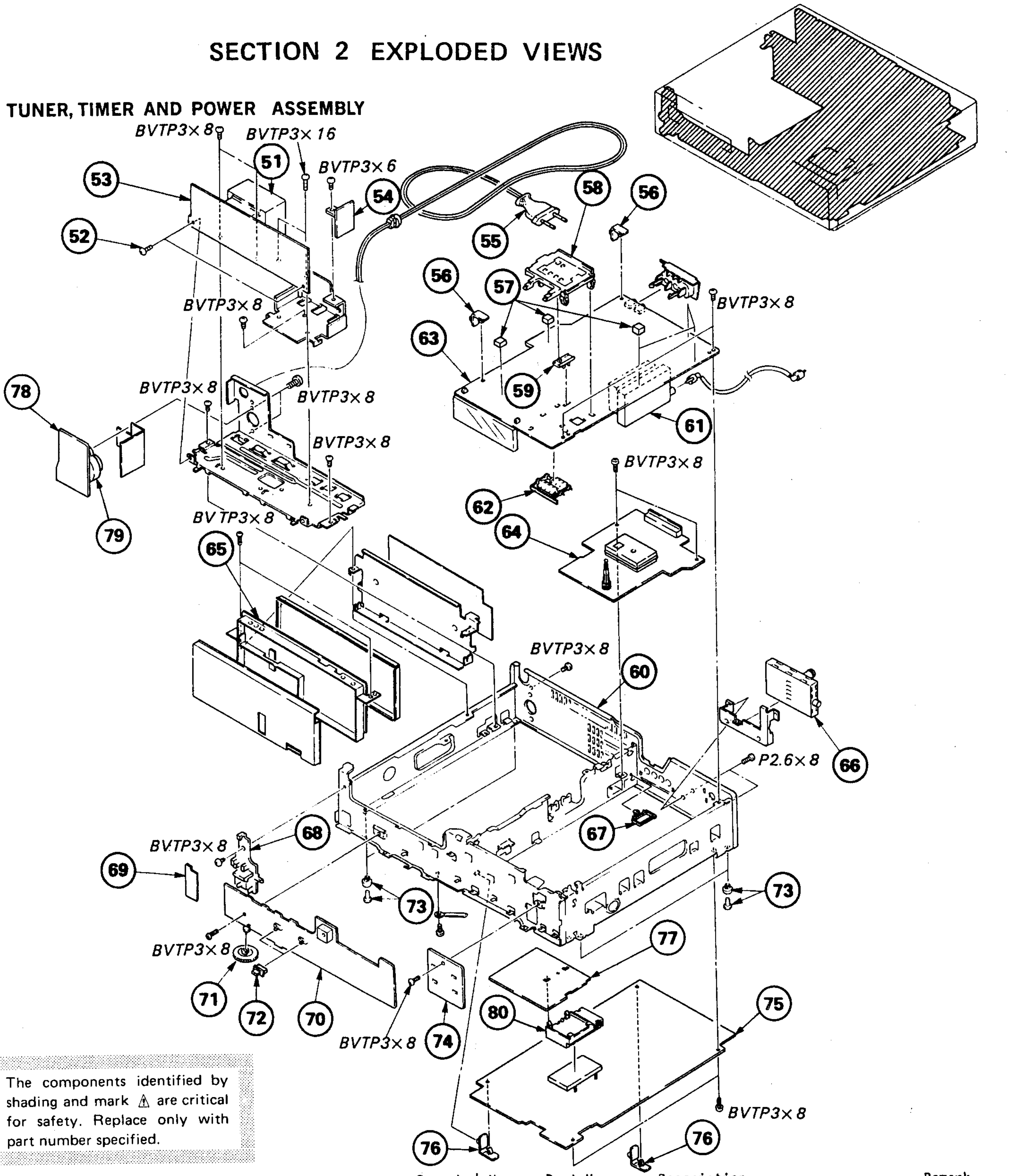
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

- Signal path

➡	: REC Y Signal
⇨	: PB Y Signal
➡	: REC CHROMA Signal
⇨	: PB CHROMA Signal
➡	: REC Y/CHROMA Signal
⇨	: PB Y/CHROMA Signal

SECTION 2 EXPLODED VIEWS

2-1. TUNER, TIMER AND POWER ASSEMBLY



The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remark
51	⚠.1-448-657-11	TRANSFORMER, POWER	
52	3-693-912-11	SCREW (3X8), TAPPING	
53	*1-620-054-11	PS-115 BOARD	
54	*1-620-200-11	DR-38 BOARD	
55	⚠.1-551-908-61	CORD, POWER, EULO PLUG	
56	*3-710-565-01	HINGE, PC BOARD	
57	9-911-842-XX	RUBBER (B)	
58	X-3710-520-1	COVER ASSY, PRESET	
59	3-693-842-01	BUTTON, AFT	
60	*3-710-596-11	PLATE (P), JACK	
61	⚠.1-463-584-11	TUNER, ET (BT-881A) (TU001)	
62	*X-3693-812-1	SHAFT ASSY, PRESET	
63	*A-6715-332-A	ST-12 BOARD, COMPLETE	
64	*A-6713-266-A	AU-26 BOARD, COMPLETE	

No.	Part No.	Description	Remark
65	*A-6711-766-A	RP-41 BOARD, COMPLETE	
66	1-464-690-11	MODULATOR, RF (RFU-857)	
67	*3-695-074-01	CLAMP, WIRE	
68	3-710-533-01	HOLDER, JACK	
69	*1-620-051-11	MF-15 BOARD	
70	*1-620-052-12	MF-16 BOARD	
71	3-710-584-01	KNOB, SHARPNESS	
72	3-684-325-01	BUTTON, SLIDE	
73	3-670-155-11	LEG	
74	*1-620-053-11	MF-17 BOARD	
75	*A-6711-767-A	VI-23 BOARD, COMPLETE	
76	*3-701-832-00	HINGE, CIRCUIT BOARD	
77	*1-626-442-11	SC-14 BOARD	
78	*1-620-055-22	VS-11 BOARD	
79	⚠.1-552-304-11	SELECTOR, VOLTAGE S905 (INDONESIA MODEL)	
80	3-716-558-01	HOLDER, SC-14 BOARD	

SECTION 3
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

SL-F90 (E model)						SL-F90 (ME model)					
Ref.No.	Part No.	Description				Ref.No.	Part No.	Description			
C148	1-102-515-00	CERAMIC	24PF	5%	50V	C148	1-102-518-00	CERAMIC	33PF	5%	50V
C160	1-101-361-00	CERAMIC	150PF	5%	50V	C160	1-102-981-00	CERAMIC	300PF	5%	50V
JW013	NO MOUNT					JW013	1-535-143-00	LEAD, JUMPER			
JW077	1-535-143-00	LEAD JUMPER				JW077	NO MOUNT				
JW089	1-535-143-00	LEAD JUMPER				JW089	NO MOUNT				
JW090	1-535-143-00	LEAD JUMPER				JW090	NO MOUNT				
R171	1-247-833-00	CARBON	1.2K	5%	1/6W	R171	1-249-416-00	CARBON	820	5%	1/6W
R317	1-247-833-00	CARBON	1.2K	5%	1/6W	R317	NO MOUNT				

Ref.No	Part No.	Description				Remark
	*1-626-442-11	SC-14 BOARD ************				
		CAPACITOR				
C001	1-101-004-61	CERAMIC	0.01MF		50V	
C002	1-102-516-61	CERAMIC	27PF	5%	50V	
C003	1-101-004-61	CERAMIC	0.01MF		50V	
C004	1-102-978-61	CERAMIC	220PF	5%	50V	
C005	1-101-004-61	CERAMIC	0.01MF		50V	
C006	1-101-004-61	CERAMIC	0.01MF		50V	
C007	1-123-306-51	ELECT	47MF	20%	10V	
C008	1-101-004-61	CERAMIC	0.01MF		50V	
C009	1-123-328-51	ELECT	4.7MF	20%	25V	
C010	1-123-306-51	ELECT	47MF	20%	10V	
C011	1-130-488-51	MYLAR	0.027MF	5%	50V	
C012	1-101-004-61	CERAMIC	0.01MF		50V	
C013	1-101-004-61	CERAMIC	0.01MF		50V	
C014	1-101-004-61	CERAMIC	0.01MF		50V	
C015	1-101-004-61	CERAMIC	0.01MF		50V	
C016	1-101-006-61	CERAMIC	0.047MF		50V	
C017	1-101-004-61	CERAMIC	0.01MF		50V	
C018	1-101-006-61	CERAMIC	0.047MF		50V	
C019	1-102-118-61	CERAMIC	0.0012M	10%	50V	
C020	1-102-516-61	CERAMIC	27PF	5%	50V	
C021	1-102-523-61	CERAMIC	56PF	5%	50V	
C022	1-123-306-51	ELECT	47MF	20%	10V	
C023	1-101-004-61	CERAMIC	0.01MF		50V	
C024	1-123-319-51	ELECT	47MF	20%	16V	
C025	1-101-004-61	CERAMIC	0.01MF		50V	
C026	1-101-004-61	CERAMIC	0.01MF		50V	

Ref.No	Part No.	Description	Remark
		FILTER	
CF001	1-527-998-11	FILTER, CERAMIC	
		CONNECTOR	
CN001	*1-560-896-11	PIN, CONNECTOR 8P	
CN002	*1-560-893-11	PIN, CONNECTOR 5P	
CN003	*1-560-895-11	PIN, CONNECTOR 7P	
CN004	*1-560-892-11	PIN, CONNECTOR 4P	
		DIODE	
D001	8-719-911-19	DIODE 1SS119	
D002	8-719-911-19	DIODE 1SS119	
D003	8-719-911-19	DIODE 1SS119	
D004	8-719-911-19	DIODE 1SS119	
D005	8-719-911-19	DIODE 1SS119	
D006	8-719-911-19	DIODE 1SS119	
D007	8-719-911-19	DIODE 1SS119	
D008	8-719-911-19	DIODE 1SS119	
		IC	
IC001	8-759-904-95	IC BA7007	
IC002	8-759-208-94	IC CX-894	
IC003	8-752-006-10	IC CX20061	
IC004	8-759-909-20	IC BA634	
		COIL	
L001	1-408-608-11	INDUCTOR 27UH	
L002	1-408-613-11	INDUCTOR 68UH	

Ref.No	P
LV001	1
LV002	1
LV003	1
Q001	8
Q002	8
Q003	8
Q004	8
Q005	8
Q006	8
Q007	8
Q008	8
Q009	8
Q010	8
Q011	8
Q012	8
Q013	8
R001	1
R002	1
R003	1
R004	1
R005	1
R006	1
R007	1
R008	1
R009	1
R010	1
R011	1
R012	1
R013	1
R014	1
R015	1
R016	1
R017	1
R018	1
R019	1
R020	1
R021	1
R022	1
R023	1
R024	1
R025	1
R026	1
R027	1
R028	1
R029	1
R030	1
R031	1
R032	1
R033	1
R034	1
R035	1
R036	1
R037	1
R038	1
RV001	1

SECTION 3

TRICAL PARTS LIST

standardization, replacements
arts list may be different from
specified in the diagrams or
onents used on the set.

ble and adjustable resistors
aracteristic curve B, unless
noted.

STORS
ors are in ohms
ammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS

- MF : μF, PF : μμF

COILS

- MMH : mH, UH : μH

SL-F90 (ME model)

		Ref.No.	Part No.	Description			
5%	50V	C148	1-102-518-00	CERAMIC	33PF	5%	50V
5%	50V	C160	1-102-981-00	CERAMIC	300PF	5%	50V
		JW013	1-535-143-00	LEAD, JUMPER			
		JW077	NO MOUNT				
		JW089	NO MOUNT				
		JW090	NO MOUNT				
5%	1/6W	R171	1-249-416-00	CARBON	820	5%	1/6W
5%	1/6W	R317	NO MOUNT				

50V
50V
50V
50V
50V

50V
% 10V
50V
% 25V
% 10V

50V
50V
50V
50V
50V

50V
50V
50V
% 50V
50V

50V
% 10V
50V
% 16V
50V

50V

Remark . Ref.No	Part No.	Description	Remark

FILTER

Ref.No	Part No.	Description
CF001	1-527-998-11	FILTER, CERAMIC

CONNECTOR

Ref.No	Part No.	Description
CN001	*1-560-896-11	PIN, CONNECTOR 8P
CN002	*1-560-893-11	PIN, CONNECTOR 5P
CN003	*1-560-895-11	PIN, CONNECTOR 7P
CN004	*1-560-892-11	PIN, CONNECTOR 4P

DIODE

Ref.No	Part No.	Description
D001	8-719-911-19	DIODE 1SS119
D002	8-719-911-19	DIODE 1SS119
D003	8-719-911-19	DIODE 1SS119
D004	8-719-911-19	DIODE 1SS119
D005	8-719-911-19	DIODE 1SS119
D006	8-719-911-19	DIODE 1SS119
D007	8-719-911-19	DIODE 1SS119
D008	8-719-911-19	DIODE 1SS119

IC

Ref.No	Part No.	Description
IC001	8-759-904-95	IC BA7007
IC002	8-759-208-94	IC CX-894
IC003	8-752-006-10	IC CX20061
IC004	8-759-909-20	IC BA634

COIL

Ref.No	Part No.	Description
L001	1-408-608-11	INDUCTOR 27UH
L002	1-408-613-11	INDUCTOR 68UH

Ref.No	Part No.	Description	Remark

VARIABLE COIL

Ref.No	Part No.	Description
LV001	1-408-532-11	COIL, VARIABLE 47UH
LV002	1-407-291-21	INDUCTOR 15MMH
LV003	1-408-513-11	COIL (VARIABLE) 22UH

TRANSISTOR

Ref.No	Part No.	Description
Q001	8-729-178-54	TRANSISTOR 2SC2785
Q002	8-729-117-54	TRANSISTOR 2SA1175
Q003	8-729-117-54	TRANSISTOR 2SA1175
Q004	8-729-900-85	TRANSISTOR DTC144WS
Q005	8-729-178-54	TRANSISTOR 2SC2785
Q006	8-729-117-54	TRANSISTOR 2SA1175
Q007	8-729-178-54	TRANSISTOR 2SC2785
Q008	8-729-900-36	TRANSISTOR DTC124ES
Q009	8-729-178-54	TRANSISTOR 2SC2785
Q010	8-729-178-54	TRANSISTOR 2SC2785
Q011	8-729-117-54	TRANSISTOR 2SA1175
Q012	8-729-900-36	TRANSISTOR DTC124ES
Q013	8-729-178-54	TRANSISTOR 2SC2785

RESISTOR

Ref.No	Part No.	Description			
R001	1-247-821-31	CARBON	390	5%	1/4W
R002	1-247-825-31	CARBON	560	5%	1/4W
R003	1-247-807-31	CARBON	100	5%	1/4W
R004	1-247-801-31	CARBON	56	5%	1/4W
R005	1-247-821-31	CARBON	390	5%	1/4W
R006	1-247-831-31	CARBON	1K	5%	1/4W
R007	1-247-843-31	CARBON	3.3K	5%	1/4W
R008	1-247-871-31	CARBON	47K	5%	1/4W
R009	1-247-853-31	CARBON	8.2K	5%	1/4W
R010	1-247-855-31	CARBON	10K	5%	1/4W
R011	1-247-839-31	CARBON	2.2K	5%	1/4W
R012	1-247-839-31	CARBON	2.2K	5%	1/4W
R013	1-247-815-31	CARBON	220	5%	1/4W
R014	1-247-831-31	CARBON	1K	5%	1/4W
R015	1-247-817-31	CARBON	270	5%	1/4W
R016	1-247-835-31	CARBON	1.5K	5%	1/4W
R017	1-247-891-31	CARBON	330K	5%	1/4W
R018	1-247-847-31	CARBON	4.7K	5%	1/4W
R019	1-247-855-31	CARBON	10K	5%	1/4W
R020	1-247-881-31	CARBON	120K	5%	1/4W
R021	1-247-879-31	CARBON	100K	5%	1/4W
R022	1-247-801-31	CARBON	56	5%	1/4W
R023	1-247-847-31	CARBON	4.7K	5%	1/4W
R024	1-247-847-31	CARBON	4.7K	5%	1/4W
R025	1-247-863-31	CARBON	22K	5%	1/4W
R026	1-247-873-31	CARBON	56K	5%	1/4W
R027	1-247-867-31	CARBON	33K	5%	1/4W
R028	1-247-824-31	CARBON	510	5%	1/4W
R029	1-247-806-31	CARBON	91	5%	1/4W
R030	1-247-791-31	CARBON	22	5%	1/4W
R031	1-247-867-31	CARBON	33K	5%	1/4W
R032	1-247-855-31	CARBON	10K	5%	1/4W
R033	1-247-849-31	CARBON	5.6K	5%	1/4W
R034	1-247-863-31	CARBON	22K	5%	1/4W
R035	1-247-831-31	CARBON	1K	5%	1/4W
R036	1-247-867-31	CARBON	33K	5%	1/4W
R037	1-247-807-31	CARBON	100	5%	1/4W
R038	1-247-807-31	CARBON	100	5%	1/4W

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV001	1-228-989-11	RES, ADJ, METAL GLAZE 470

SECTION 4 ELECTRICAL ADJUSTMENTS

During the adjustment, see the parts arrangement diagram relevant to the adjustment on page 21.

SECAM VIDEO SYSTEM ADJUSTMENT

- Make this adjustment after adjusting the PAL video system.
- For this adjustment, use the equipment listed below in conjunction with an alignment tape and SECAM color bar signals.

[Equipment required]

1) SECAM color Monitor TV
2) Oscilloscope, Dual-trace, Bandwidth...more than 10 MHz with delay mode
3) SECAM color-Bar Generator
4) Alignment Tape, Type : KR5-1J, Code No. 8-969-996-03

[Setup for adjustment]

In this adjustment, video signals obtained from pattern generator will be used as adjustment sig Therefore, the video output signals should be wi the specifications.

Verify video signals by connecting an oscillos to VIDEO OUT connector (75Ω terminated). Cł that the video signals are flat when the amplit of the horizontal sync signal is about 0.3 Vp-p, amplitude of the video portion is about 0.7 Vp-p, the amplitude of the burst signal is about 0.3 V The video signal (color-bar signal) used in adjustment is shown in Fig. 1.

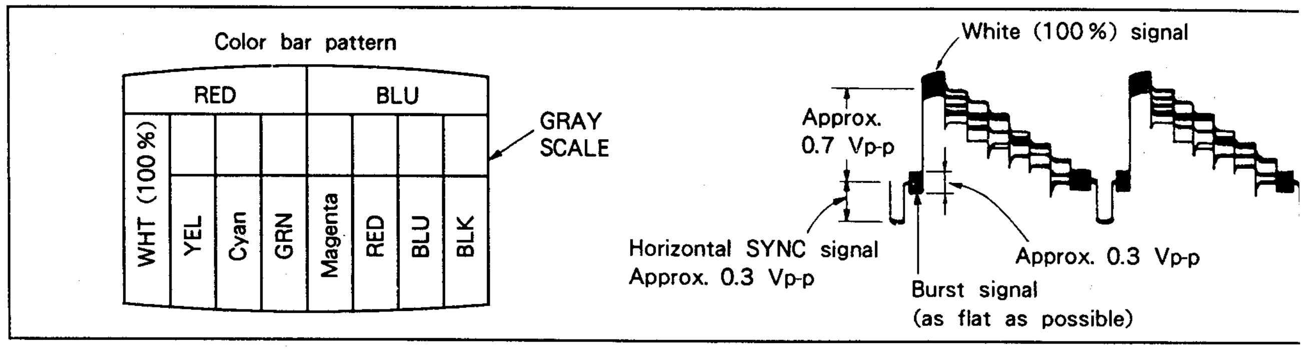


Fig. 1. SECAM video (color bar) signal

[Alignment tape]
KR5-1J

	Video signal	Audio signal	Playing time	Use for
1	Color bars	3 kHz, − 10 dB	5 min	General performance, tape speed check switching position adjustment.
2	Monoscope	333 Hz, − 30 dB	5 min	Video head dihedral , audio lev adjustment.
3	RF sweep	5 kHz, − 30 dB	5 min	Video , audio frequency characteristic audio azimuth adjustment marker : 1 MF 2 MHz, 3.58 MHz, 4.5 MHz, 5.2 MHz.
4	Tracking 1 MHz (CH-A) ∗1 (Channel B is inserted in every 3 frames.)	1 kHz, − 10 dB ∗2 (Signal is dropped out in the positions where channel B is inserted.)	5 min	Tracking, Audio height adjustments CTI Position check (Check if ∗1 and ∗2 are the san position.)

SECTION 4 ELECTRICAL ADJUSTMENTS

During the adjustment, see the parts arrangement diagram relevant to the adjustment on page 21.

SECAM VIDEO SYSTEM ADJUSTMENT

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[Equipment required]

1) SECAM color Monitor TV
2) Oscilloscope, Dual-trace, Bandwidth...more than 10 MHz with delay mode
3) SECAM color-Bar Generator
4) Alignment Tape, Type : KR5-1J,
Code No. 8-969-996-03

[Setup for adjustment]

In this adjustment, video signals obtained from the pattern generator will be used as adjustment signals. Therefore, the video output signals should be within the specifications.

Verify video signals by connecting an oscilloscope to VIDEO OUT connector (75Ω terminated). Check that the video signals are flat when the amplitude of the horizontal sync signal is about 0.3 Vp-p, the amplitude of the video portion is about 0.7 Vp-p, and the amplitude of the burst signal is about 0.3 Vp-p. The video signal (color-bar signal) used in this adjustment is shown in Fig. 1.

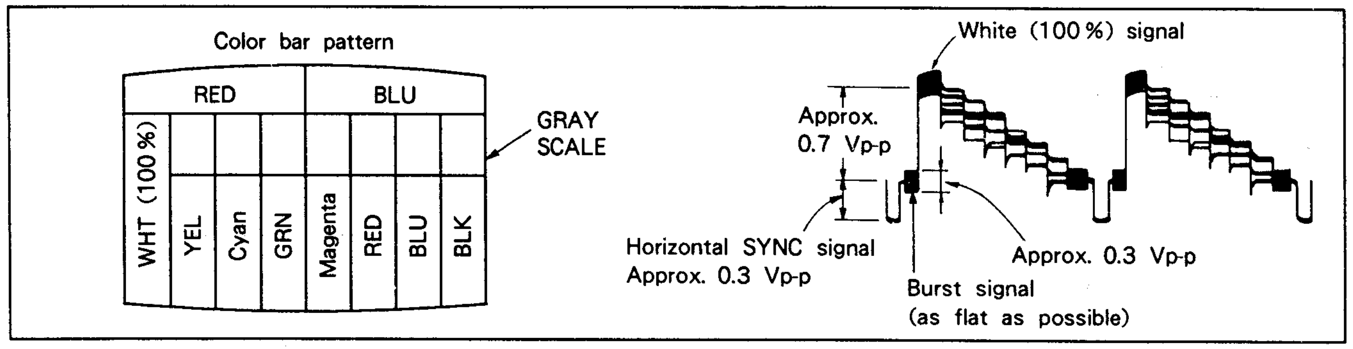


Fig. 1. SECAM video (color bar) signal

[Alignment tape]
KR5-1J

	Video signal	Audio signal	Playing time	Use for
1	Color bars	3 kHz, − 10 dB	5 min	General performance, tape speed checks, switching position adjustment.
2	Monoscope	333 Hz, − 30 dB	5 min	Video head dihedral, audio level adjustment.
3	RF sweep	5 kHz, − 30 dB	5 min	Video, audio frequency characteristics, audio azimuth adjustment marker: 1 MHz, 2 MHz, 3.58 MHz, 4.5 MHz, 5.2 MHz.
4	Tracking 1 MHz (CH-A) ＊1 (Channel B is inserted in every 3 frames.)	1 kHz, − 10 dB ＊2 (Signal is dropped out in the positions where channel B is inserted.)	5 min	Tracking, Audio height adjustments CTL Position check (Check if ＊1 and ＊2 are the same position.)

1. SECAM ACK Adjustment (SC-14 Board)

Mode	E-E
Signal	SECAM color bar
Measurement Point	Pin ⑨ of IC001
Measuring Instrument	Oscilloscope
Adjusting Element	LV002, RV001
Specified Value	5.5 ± 0.2 Vp-p

Adjusting method :

1) Adjust LV002 until the amplitude is a maximum.
2) Adjust RV001 to 5.5 ± 0.2 Vp-p.

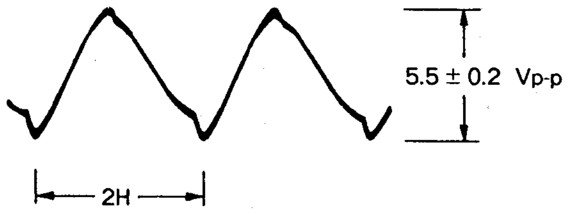


Fig. 2. SECAM ACK adjustment

2. Bell Filter Adjustment (SC-14 Board)

Mode	E-E
Signal	SECAM color bar
Measurement Point	CH1 : Pin ⑥ of CN001 EXT TRIG : Pin ⑤ of CN001
Measuring Instrument	Oscilloscope TRIGGER SOURCE : EXT
Adjusting Element	LV003
Specified Value	Flat waveform

Adjusting method :

1) Adjust LV003 until the waveform is flat.

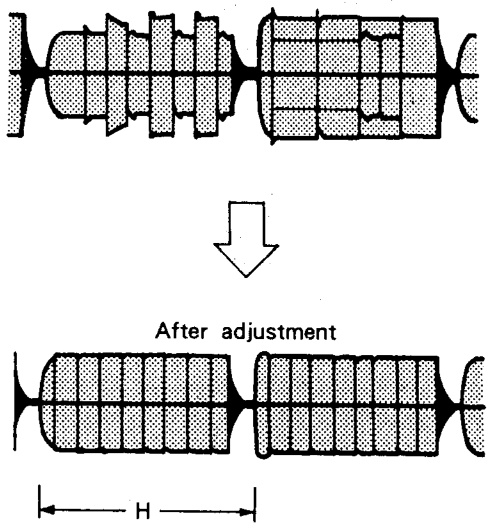


Fig. 3. Bell filter adjustment

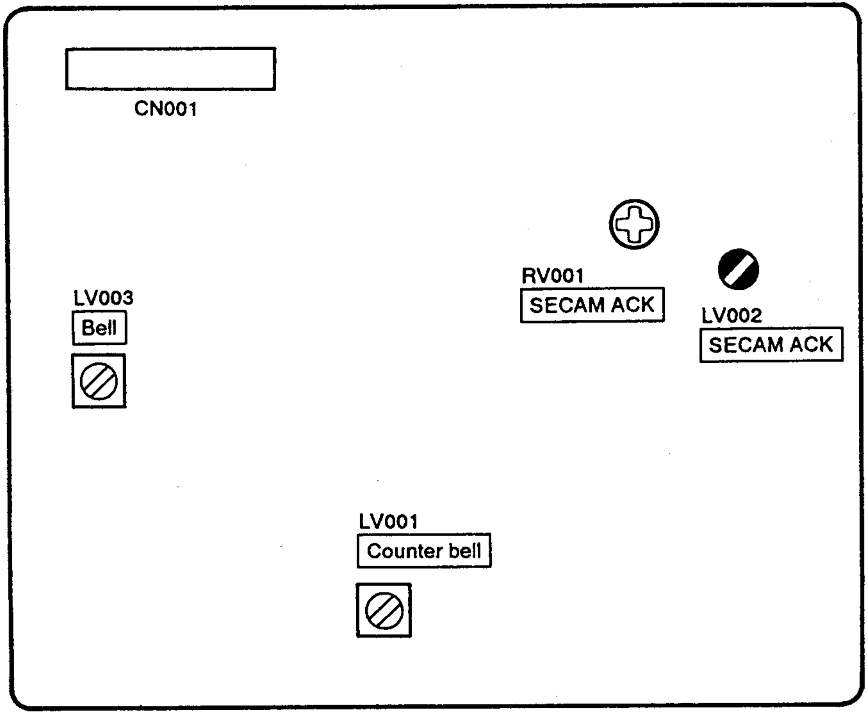
3. Counter Bell Filter Adjustment (SC-14 Board)

Mode	Self-recording and playback
Signal	SECAM color bar
Measurement Point	Adjust while observing the SECAM monitor TV screen.
Measuring Instrument	
Adjusting Element	LV001
Specified Value	Cleanest border between the red and blue areas

Adjusting method :

1) Record SECAM color bar signals.
2) Playback the recorded signals.
3) While observing the monitor TV screen, adjust LV001 until the border between the red and blue areas is at its cleanest (minimum beats).

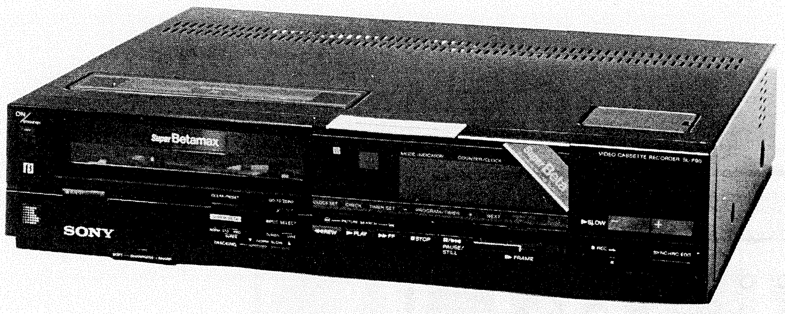
SC-14 BOARD (COMPONENT SIDE)


CN001
RV001
SECAM ACK
LV003
Bell
LV002
SECAM ACK
LV001
Counter bell

SL-F90
RMT-146

SERVICE MANUAL

ME Model



Super Betamax

SL-F90(ME model) is a model whose design has been based on SL-F90(E model).
On this service manual , only differences from SL-F90(E model) are described.

المواصفات

النظام

نظام تسجيل الصورة	مسح حلزوني براسين دورانيين
اشارة الصورة	مقاييس CCIR ، الوان بال PAL وسيكام SECAM
تغطية القنوات	VHF : قنوات أوروبا الغربية من E2 الى E12 UHF : قنوات أوروبا الغربية من E21 الى E68 (يمكن ضبط ما يصل الى ٣٠ برنامجا ضبط مسبقا)
دخل الهوائي	مقبس هوائي لا تماثلي ٧٥ أوم
اشارة خرج تردد الراديو	قنوات UHF من E30 الى E39 (قابلة للتغيير) ٧٥ أوم، غير متوازن

الصورة

الدخل: VIDEO IN	مقبس فونو: ١,٠ فولت $^{+٠,١}_{-٠,٥}$ فولت (p-p) ٧٥ أوم، غير متوازن، تزامن سالب
الخرج: VIDEO OUT	مقبس فونو: ١,٠ ± ٠,١ فولت (p-p) ٧٥ أوم، غير متوازن، تزامن سالب

الصوت

الدخل: AUDIO IN	مقبس فونو: ٤٧ كيلوأوم، ـ ١٠ ديسيبل (صفر ديسيبل = ٠,٧٧٥ فولت جذر متوسط مربع التيار)
الخرج: AUDIO OUT	مقبس فونو: معاوقة الحمل اقل من ١٠ ك أوم، ـ ١٠ ديسيبل مع حمل ٤٧ ك أوم، غير متوازن

حركة الشريط

سرعة الشريط	١٨,٧٢ مم/ثانية
اقصى مدة للتسجيل	ساعتان و١٠ دقائق (مع كاسيت سوني L-500) ٣ ساعات و١٥ دقيقة (مع L-750)
مدة التقديم السريع/اعادة اللف	خلال ٥ دقائق (مع L-500)

المؤقت

الساعة	تأمين كريستال
بيان الوقت	دورة من ٢٤ ساعة
تهيئة ضبط المؤقت (للتسجيل فقط)	٦ أحداث/اسبوع، قابل للضبط على أي يوم أو على ايام الاسبوع السبعة

عام

متطلبات القدرة الكهربائية	تيار متردد ١١٠ أو ١٢٧ أو ٢٢٠ أو ٢٤٠ فولت قابل للضبط، ٥٠/٦٠ هرتز
استهلاك التيار الكهربائي	٣٩ وات
درجة حرارة التخزين	− ٢٠°م الى + ٦٠°م
درجة حرارة التشغيل	٥°م الى ٤٠°م
الابعاد	٤٣٠ × ٩٥ × ٣٦٧ مم (عرض/ارتفاع/عمق) مع الاجزاء والضوابط البارزة
الوزن	٨,٠ كجم

موجه التحكم عن بعد RMT-146

نظام التحكم عن بعد	تحكم بالاشعة تحت الحمراء
متطلبات القدرة الكهربائية	تيار مباشر ٣ فولت، بطاريتين IEC فئة R6 (حجم AA)
الابعاد	٤٥ × ٢٠ × ١٧٥ مم (عرض/ارتفاع/عمق) مع الاجزاء والضوابط البارزة
الوزن	١٠٥ جم تقريبا مع البطاريات

الكماليات المجهزة

كبل مشترك المحور ٧٥ أوم لتوصيل المسجل بالتلفزيون ١
مفك براغي لضبط قناة تردد الراديو ١
موجه التحكم عن بعد RMT-146 مع بطاريتين IEC فئة R6 (حجم AA) ١

التصميم والمواصفات عرضة للتغيير بدون اشعار.

Beta
VIDEO CASSETTE RECORDER

SONY®

MICROFILM

SECTION 1
SCHEMATIC DIAGRAM AND PRINTED WIRING BOARDS

SC-14(VIDEO) PRINTED WIRING BOARD

—Ref. No. 9,000 series—

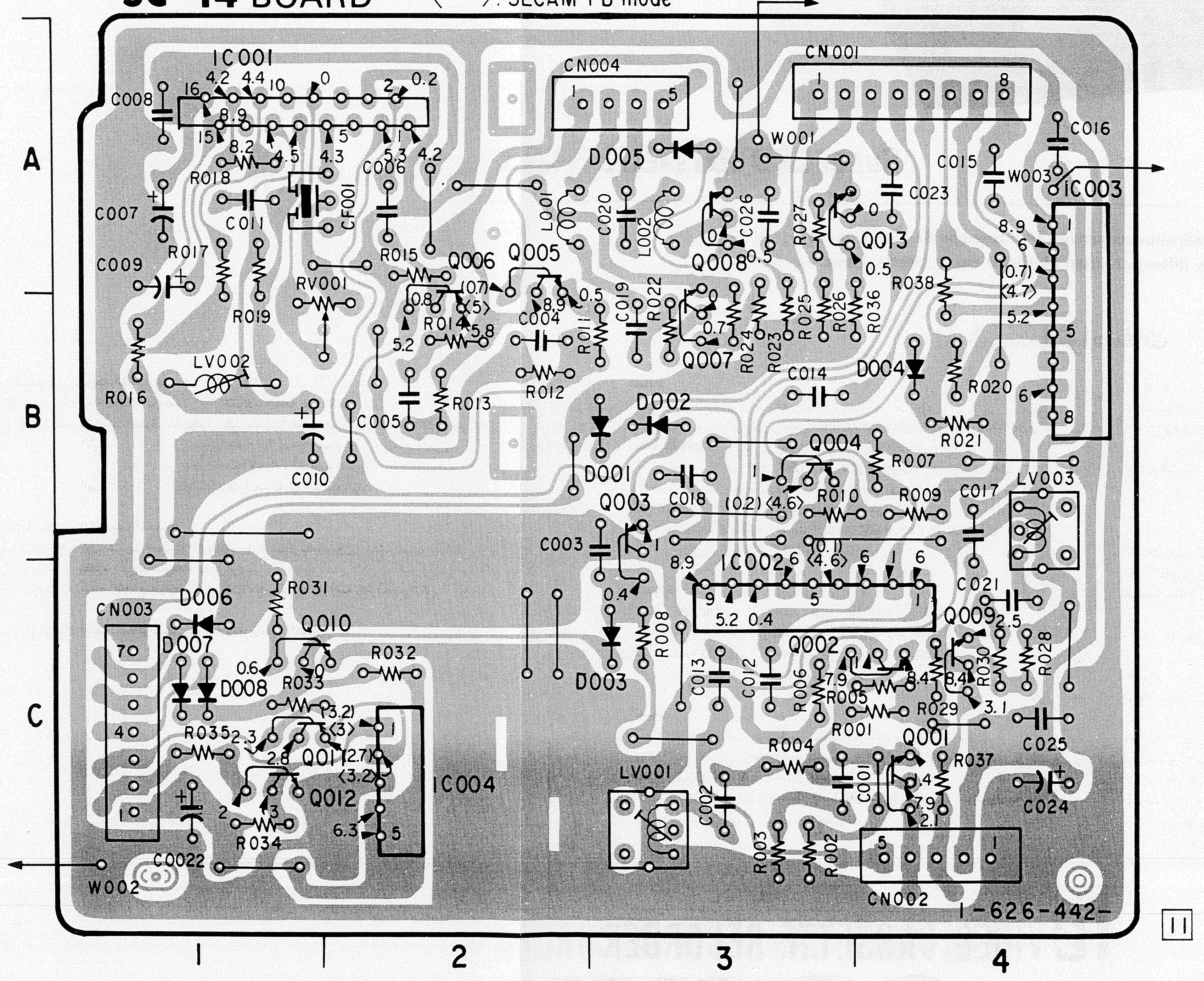
Note:

- ○— : indicates a lead wire mounted on the component side.
- ▨ : Pattern from the side which enables seeing.
- ▨ : B+ pattern from the side which enables seeing.

SC-14 BOARD	
D001	B-3
D002	B-3
D003	C-3
D004	B-4
D005	A-3
D006	C-1
D007	C-1
D008	C-1
IC001	A-1
IC002	C-3
IC003	A-4
IC004	C-2
LV001	C-3
LV002	B-1
LV003	B-4
Q001	C-4
Q003	C-3
Q004	B-3
Q005	A-2
Q006	B-2
Q007	B-3
Q008	A-3
Q009	C-4
Q010	C-1
Q011	C-1
Q012	C-1
Q013	A-4
RV001	B-2

SC-14 BOARD

no mark : SECAM REC / PB mode
( ) : SECAM REC mode
〈 〉: SECAM PB mode


A
B
C
1
2
3
4
IC001
IC002
IC003
IC004
CN001
CN002
CN003
CN004
D001
D002
D003
D004
D005
D006
D007
D008
Q001
Q002
Q003
Q004
Q005
Q006
Q007
Q008
Q009
Q010
Q012
Q013
Q01
LV001
LV002
LV003
RV001
CF001
L001
L002
W001
W002
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C001
C002
C003
C004
C005
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C025
C026
R001
R002
R003
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R031
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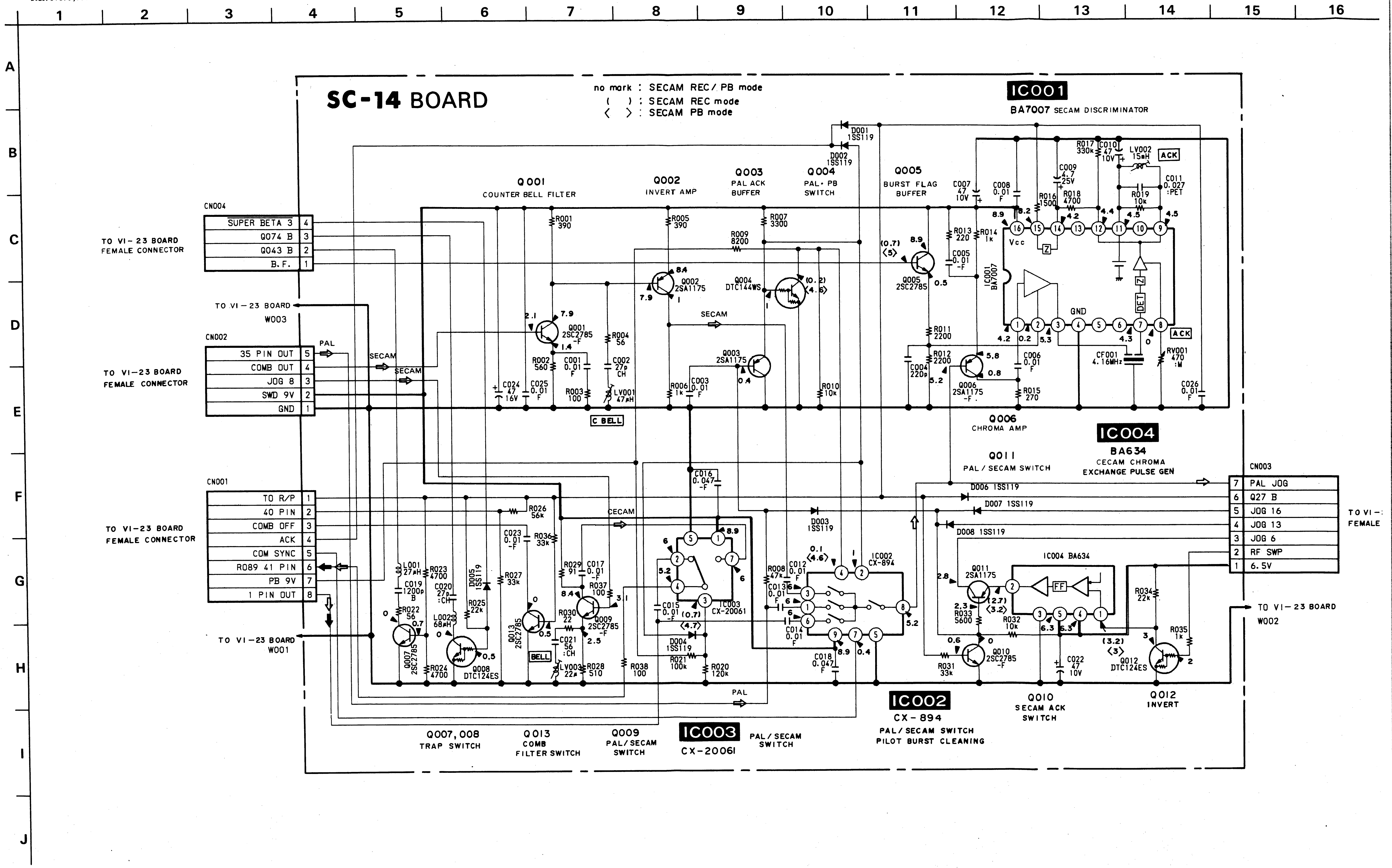
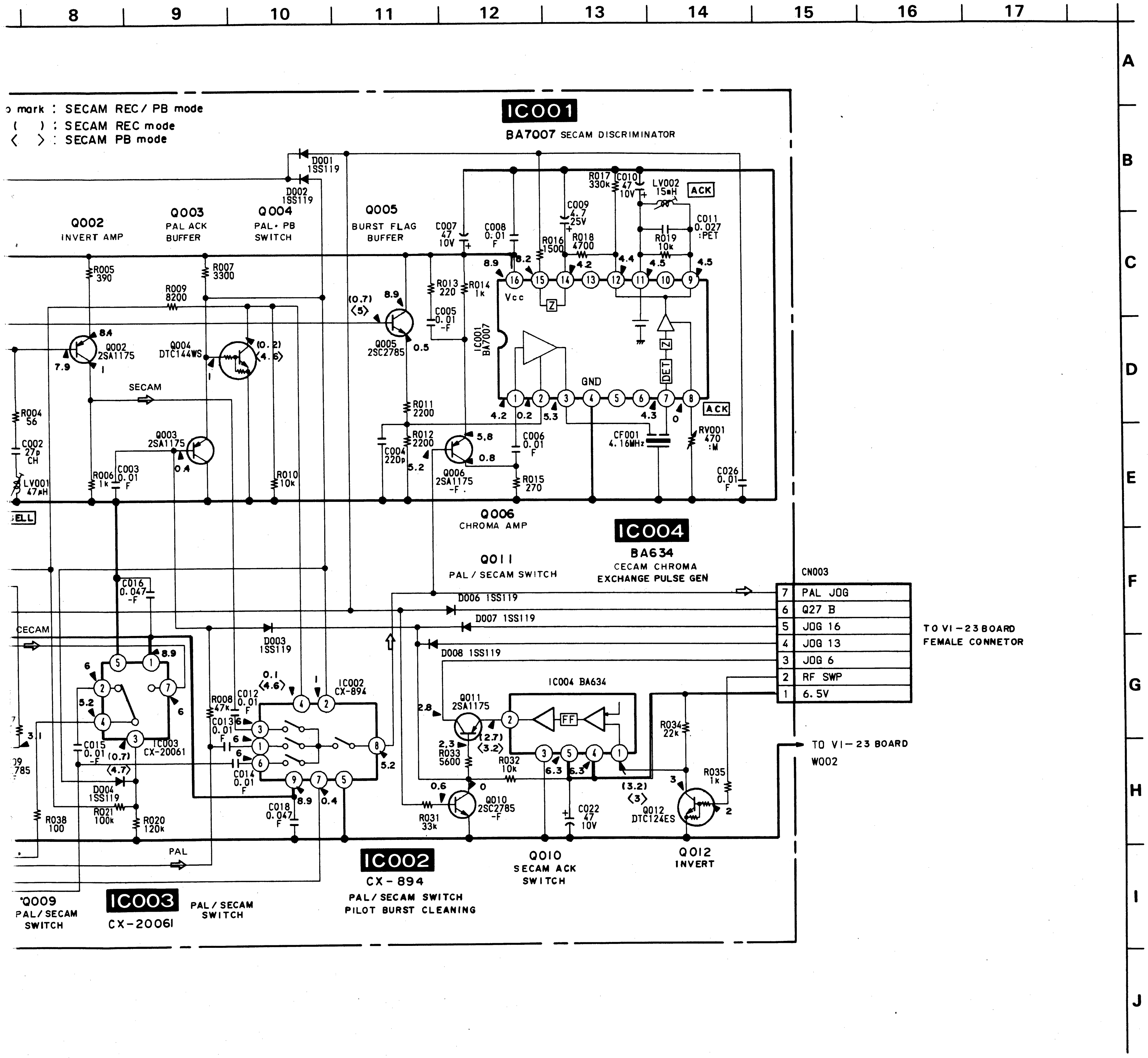
R035
R036
R037
R038
1-626-442-

11

SC-14(VIDEO) SCHEMATIC DIAGRAM

—Ref. No. 9,000 series—


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J
SC-14 BOARD
no mark : SECAM REC/ PB mode
( ) : SECAM REC mode
〈 〉 : SECAM PB mode
IC001
BA7007 SECAM DISCRIMINATOR
Q001
COUNTER BELL FILTER
Q002
INVERT AMP
Q003
PAL ACK BUFFER
Q004
PAL・PB SWITCH
Q005
BURST FLAG BUFFER
Q006
CHROMA AMP
Q011
PAL / SECAM SWITCH
IC004
BA634
CECAM CHROMA EXCHANGE PULSE GEN
CN004
SUPER BETA 3
Q074 B
Q043 B
B.F.
TO VI-23 BOARD FEMALE CONNECTOR
TO VI-23 BOARD
W003
CN002
35 PIN OUT
COMB OUT
JOG 8
SWD 9V
GND
TO VI-23 BOARD FEMALE CONNECTOR
PAL
SECAM
C BELL
CN001
TO R/P
40 PIN
COMB OFF
ACK
COM SYNC
R089 41 PIN
PB 9V
1 PIN OUT
TO VI-23 BOARD FEMALE CONNECTOR
TO VI-23 BOARD
W001
CN003
PAL JOG
Q27 B
JOG 16
JOG 13
JOG 6
RF SWP
6.5V
TO VI-
FEMALE
TO VI-23 BOARD
W002
D001 1SS119
D002 1SS119
D003 1SS119
D004 1SS119
D005 1SS119
D006 1SS119
D007 1SS119
D008 1SS119
Q001 2SC2785 -F
Q002 2SA1175
Q003 2SA1175
Q004 DTC144WS
Q005 2SC2785
Q006 2SA1175 -F
Q007 2SC2785
Q008 DTC124ES
Q009 2SC2785 -F
Q010 2SC2785 -F
Q011 2SA1175
Q012 DTC124ES
Q013 2SC2785
IC001 BA7007
IC002 CX-894
IC003 CX-20061
IC004 BA634
Vcc
GND
DET
ACK
BELL
CF001 4.16MHz
RV001 470 :M
LV001 47μH
LV002 15μH
LV003 22μ
L001 27μH
L002 68μH
R001 390
R002 560
R003 100
R004 56
R005 390
R006 1k
R007 3300
R008 47k
R009 8200
R010 10k
R011 2200
R012 2200
R013 220
R014 1k
R015 270
R016 1500
R017 330k
R018 4700
R019 10k
R020 120k
R021 100k
R022 56
R023 4700
R024 4700
R025 22k
R026 56k
R027 33k
R028 510
R029 91
R030 22
R031 33k
R032 10k
R033 5600
R034 22k
R035 1k
R036 33k
R037 100
R038 100
C001 0.01 F
C002 27p CH
C003 0.01 F
C004 220p
C005 0.01 -F
C006 0.01 F
C007 47 10V
C008 0.01 F
C009 4.7 25V
C010 47 10V
C011 0.027 :PET
C012 0.01 F
C013 0.01 F
C014 0.01 F
C015 0.01 -F
C016 0.047 -F
C017 0.01 -F
C018 0.047 F
C019 1200p B
C020 27p :CH
C021 56 :CH
C022 47 10V
C023 0.01 -F
C024 47 16V
C025 0.01 F
C026 0.01 F
Q007, 008
TRAP SWITCH
Q013
COMB FILTER SWITCH
Q009
PAL/SECAM SWITCH
IC003
CX-20061
PAL / SECAM SWITCH
IC002
CX-894
PAL / SECAM SWITCH PILOT BURST CLEANING
Q010
SECAM ACK SWITCH
Q012
INVERT


8
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17
A
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D
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F
G
H
I
J
mark : SECAM REC/ PB mode
( ) : SECAM REC mode
〈 〉 : SECAM PB mode
IC001
BA7007 SECAM DISCRIMINATOR
Q002
INVERT AMP
Q003
PAL ACK
BUFFER
Q004
PAL • PB
SWITCH
Q005
BURST FLAG
BUFFER
D001
1SS119
D002
1SS119
R005
390
R007
3300
R009
8200
Q002
2SA1175
Q004
DTC144WS
Q005
2SC2785
SECAM
R004
56
C002
27p
CH
LV001
47μH
Q003
2SA1175
C003
0.01
F
R006
1k
R010
10k
R011
2200
R012
2200
C004
220p
Q006
2SA1175
-F
R015
270
C006
0.01
F
C007
47
10V
C008
0.01
F
R013
220
R014
1k
C005
0.01
-F
R016
1500
R017
330k
C010
47
10V
C009
4.7
25V
R018
4700
LV002
15mH
ACK
C011
0.027
:PET
R019
10k
Vcc
GND
DET
IC001
BA7007
CF001
4.16MHz
RV001
470
:M
ACK
C026
0.01
F
Q006
CHROMA AMP
IC004
BA634
CECAM CHROMA
EXCHANGE PULSE GEN
Q011
PAL / SECAM SWITCH
CN003
7 PAL JOG
6 Q27 B
5 JOG 16
4 JOG 13
3 JOG 6
2 RF SWP
1 6.5V
TO VI-23 BOARD
FEMALE CONNETOR
D006 1SS119
D007 1SS119
D008 1SS119
D003
1SS119
C016
0.047
-F
SECAM
IC002
CX-894
IC003
CX-20061
R008
47k
C012
0.01
F
C013
0.01
F
C014
0.01
F
C015
0.01
-F
D004
1SS119
R021
100k
R020
120k
R038
100
C018
0.047
F
IC004 BA634
FF
Q011
2SA1175
R033
5600
R032
10k
R031
33k
Q010
2SC2785
-F
C022
47
10V
Q012
DTC124ES
R034
22k
R035
1k
TO VI-23 BOARD
W002
PAL
Q009
PAL/SECAM
SWITCH
IC003
CX-20061
PAL / SECAM
SWITCH
IC002
CX-894
PAL/SECAM SWITCH
PILOT BURST CLEANING
Q010
SECAM ACK
SWITCH
Q012
INVERT

Note:

- All resistors are in ohms, 1/4W unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics. and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repair.
- ━ : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

When indicating parts by reference number, please include the board name.

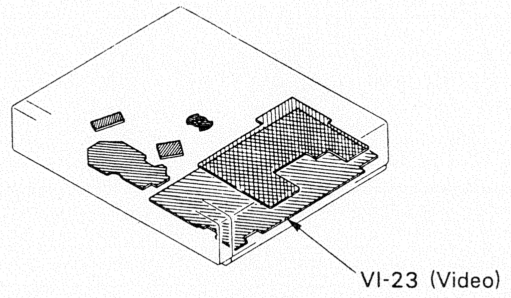
- **Signal path**
  ➡ : REC CHROMA Signal
  ⇨ : PB CHROMA Signal

VI-23(VIDEO) PRINTED WIRING BOARD

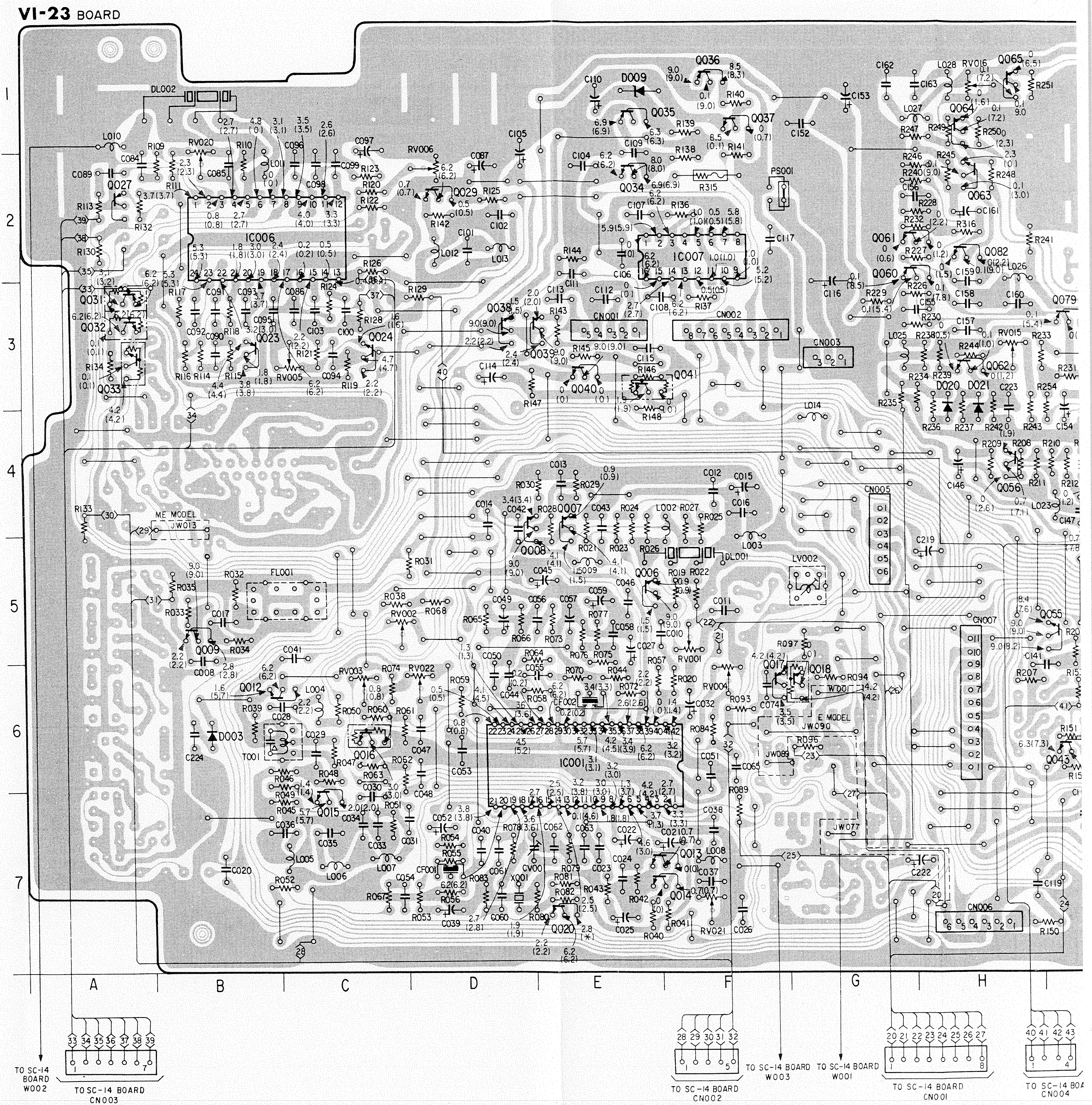
—Ref. No. 3,000 series—

Note:

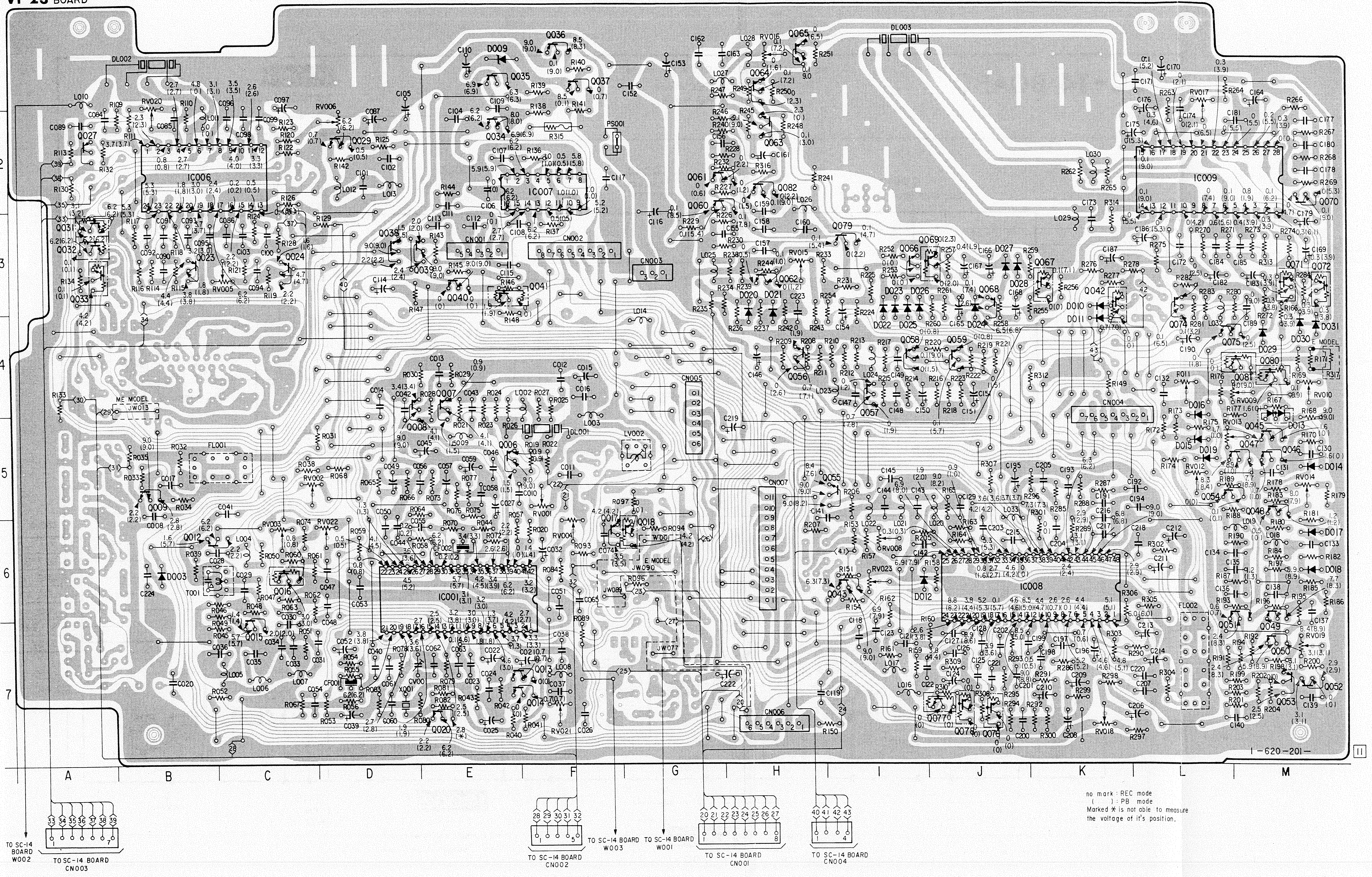
- ○— : indicates a lead wire mounted on the component side.
- ▨ : Pattern from the side which enables seeing.
- ▨ : B+ pattern from the side which enables seeing.



CV001	D-7
D003	B-6
D009	E-1
D010	K-3
D011	K-4
D012	I-6
D013	M-5
D014	M-5
D015	L-5
D016	L-5
D017	M-6
D018	M-6
D019	L-5
D020	H-3
D021	H-3
D022	I-3
D023	I-3
D024	J-3
D025	I-3
D026	I-3
D027	J-3
D028	J-3
D029	M-4
D030	M-4
D031	M-4
IC001	E-6
IC006	B-2
IC007	F-2
IC008	K-6
IC009	L-2
LV002	G-5
Q006	E-5
Q007	E-4
Q008	E-4
Q009	B-5
Q012	C-6
Q013	D-7
Q014	D-7
Q015	C-7
Q016	C-6
Q017	F-6
Q018	G-6
Q020	E-7
Q023	B-3
Q024	C-3
Q027	A-2
Q029	D-2
Q031	A-3
Q032	A-3
Q033	A-3
Q034	E-2
Q035	E-1
Q036	F-1
Q037	F-1
Q038	D-3
Q039	E-3
Q040	E-3
Q041	E-3
Q042	K-3
Q043	I-6
Q045	M-5
Q046	M-5
Q047	M-5
Q048	M-6
Q049	M-7
Q050	M-7
Q051	M-7
Q052	M-7
Q053	M-7
Q054	L-5
Q055	I-5
Q056	H-4
Q057	I-4
Q058	I-4
Q059	J-4
Q060	G-2
Q061	G-2
Q062	H-3
Q063	H-2
Q064	H-1
Q065	H-1
Q066	I-3
Q067	K-3
Q068	J-3
Q069	J-3
Q070	M-2
Q071	M-3
Q072	M-3
Q074	L-3
Q075	L-4
Q076	J-7
Q077	J-7
Q078	J-7
Q079	I-3
Q080	M-4
Q081	M-4
Q082	H-2
RV001	F-5
RV002	C-5
RV003	C-6
RV004	F-6
RV005	C-3
RV006	D-2
RV008	I-6
RV009	M-4
RV010	M-4
RV011	L-4
RV012	L-5
RV013	L-5
RV014	M-5
RV015	H-3
RV016	H-1
RV017	L-1
RV018	K-7
RV019	M-7
RV020	B-1
RV021	F-7
RV022	D-6
RV023	I-6


VI-23 BOARD
1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
IC006
IC007
IC001
CN001
CN002
CN003
CN005
CN006
CN007
LV002
FL001
PS001
DL001
DL002
ME MODEL JW013
E MODEL JW090
JW077
TO SC-14 BOARD W002
TO SC-14 BOARD CN003
TO SC-14 BOARD CN002
TO SC-14 BOARD W003
TO SC-14 BOARD W001
TO SC-14 BOARD CN001
TO SC-14 BOA CN004

VI-23 BOARD


IC001
IC006
IC007
IC008
IC009
CN001
CN002
CN003
CN004
CN005
CN006
CN007
DL001
DL002
DL003
FL001
FL002
PS001
LV002
ME MODEL
E MODEL
1-620-201-
11
1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
J
K
L
M
TO SC-14 BOARD W002
TO SC-14 BOARD CN003
TO SC-14 BOARD CN002
TO SC-14 BOARD W003
TO SC-14 BOARD W001
TO SC-14 BOARD CN001
TO SC-14 BOARD CN004

no mark : REC mode
( ) : PB mode
Marked ✻ is not able to measure
the voltage of it's position.